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COMPUTERWORLD

INSIDE

Product Spotlight — What comes after peripheral sharing? Page 83.

In Depth — Tracking PC software can bag some big game. Page 101.

Profile: Former disc jockey now spins systems in largest television market. Page 111.

Unix International sets sail while OSF puts AT&T on hold. Page 8.

DEC desktop message falls flat with lukewarm support from micro software vendors. Page 6.

Prime held hostage: Week 3. Prime raises white knight specter while MAI readies takeover pitch for Wall Street this week. Page 15.

LAN vendors ready to grab for power in effort to steal token-ring standard out from under IBM's wing. Page 6.

HP superconductor effort is long-term push for future generation of computers. Page 29.

Arthur Andersen boosts stature of consulting group in wake of desertions. Page 119.

Digital net plans zap AT&T profit

BY CLINTON WILDER
CW STAFF

NEW YORK — Closing the financial books on its obsolescence-bound analog network equipment, AT&T announced last week a $6.7 billion write-down that will burden the telecommunications giant with the first yearly loss in its history.

AT&T said the write-down will give it more financial muscle with which to accelerate its move to all-digital service. Its goal is to offer 95% digital-switched traffic in the U.S. by mid-1989 and 100% by the end of 1990.

The dramatic announcement, which will result in a $3.9 billion fourth-quarter after-tax charge, follows much smaller analog write-downs by competitors MCI Communications Corp. and U.S. Sprint Communications Co.

Continued on page 144

No threat seen in IBM treaty

BY ROBERT MORAN
CW STAFF

NEW YORK — The American Arbitration Association's resolution last week of a high-stakes battle between IBM and Fujitsu Ltd. has eliminated the immediate possibility of an "MVS/F" emerging on U.S. shores.

Last week's announcement settled a lengthy dispute over Fujitsu's use of IBM code (see story page 4). Strict limitations on just which portions of IBM's source code and licensed manuals Fujitsu will be able to examine have eased the tension felt by independent software developers, observers said, and will likely dampen the hopes of MVS users looking for Fujitsu competition in the U.S. to rein in IBM's prices.

Jay Goldberg, chairman of Money Management Systems in New York and chairman of ADAPSO in 1987, said that he "didn't see anything that would give Fujitsu a preemptive advantage over independent software developers." Last year, Goldberg roundly criticized the agreement that gave Fujitsu access to IBM source code as a blow to the independent software industry.

In contrast, Martin Goetz at Syllogy Corp. said the arbitration created some competition with the independent software companies that are building complementary software. Despite IBM's responsiveness in working closely with the independents, Goetz said Fujitsu will be able to introduce complementary software within five years. "We would like access to that code," he added.

Not hurt but helped

Most observers, however, did not express concern over whether Fujitsu will be able to wrest away a share of the MVS market in the U.S. If anything, said Frank Gens, vice-president of technology assessment at IDC Financial Services Corp. in Framingham, Mass., the settlement will only help Fujitsu compete on its own Japanese turf, in Australia and, less so, in Europe.

The mainframe marketplace

Continued on page 4

Key points

- Total costs to Fujitsu amount to $833.2 million.
- Fujitsu will pay IBM $237 million for past use of older programs in developing operating systems software.
- Fujitsu gets access to IBM programming material for over 900 programs and utilities at an annual fee of $25.7 to $51.3 million.
- Facility to be set up for Fujitsu to examine licensed manuals, source code.
- Both companies can review unlicensed manuals and analyze object-code programs outside the facility, subject to restrictions.
- Fujitsu can extract information from any new IBM programs released from Jan. 1, 1988, until June 25, 1997.
- For IBM programs released before Jan. 1, 1988, Fujitsu can extract program details, interface information.

Worm dissection leads some to say attack was deliberate

BY MICHAEL ALEXANDER
CW STAFF

The worm program that caused thousands of computers in the nationwide Internet network to shut down last month was shoddily written, even though it was devastatingly functional.

Some scientists theorize that the worm may have been the work of at least two programmers; they believe that the authors may have rushed the job in order to get the worm into the Internet system before the windows in the University of California at Berkeley's Unix 4.3, which the worm ultimately slipped through, were closed.

The worm is believed to have been the handiwork of Robert T. Morris Jr., a graduate student in computer science at Cornell University.

Those who have examined the code speculate that the attack was deliberate and not accidental, as Morris is alleged to have claimed, because the program is without any checks that would have kept the worm under control.

Computer scientists at several universities have captured and reverse-compiled the worm in an effort to determine how it was able to disrupt the network. While the reverse-engineered version is not an exact replica of the worm, it functions exactly like the original, several comput-

Continued on page 145

Milnet inoculation

- Defense network cut off from Internet after new hacker incident. Page 145.

Waiting . . . and warming

BY J. A. SAVAGE
CW STAFF

Move north.

That's the advice Warren Washington offers after spending more than 2,000 CPU hours on two Cray Research, Inc. supercomputers modeling what the greenhouse effect will do to the global climate during the next century.

Perhaps this information could not have been developed in time to halt the Earth's eventual warming, but Washington, director of the Climate and Global Dynamics Division of the National Center for Atmospheric Research, could have let the public in on it earlier.

Although the information has been critical to the U.S. and

Continued on page 144

NCAR's *Boulder, Colo., headquarters*

NEWSPAPER

SECOND CLASS MAIL

IN THIS ISSUE

Texas leaguer. TI will introduce 16M bit/sec. token-ring chip set featuring a single processor and support for up to 260 active stations per ring. Page 7.

On the Vines. Banyan announces Mac-IBM PC electronic mail gateway that is reportedly fully integrated with its Virtual Network System. Page 18.

NEWS

4 Doubt surfaces regarding Fujitsu's 370 software compatibility.

6 The Open Token Foundation arises to champion token-ring interoperability.

6 Apollo, British firm challenge token-ring patent holder.

6 DEC PC rally fizzles as MS-DOS and concrete plans get lost in shuffle.

7 Don't expect to find an Apple token-ring in your stocking this Christmas.

8 Unix International (nee Archer group) gets down to business.

8 The OSF slams door in AT&T's face.

10 Hewlett-Packard to expose backers of Openview net management interface.

10 Adabas to run on ESA/MVS early next year, Software AG vows.

14 U.S. firms fear telecom congress will attach tariffs to private data nets.

15 Ford may play Prime's white knight in takeover drama.

15 Soviets push low-price PCs on Sweden.

18 AT&T 900 service to encompass voice, data communication with databases.

144 Digital long-distance has some users hung up.

145 Defense Department shelters Milnet from hacker incursions.

145 Arpanet virus grand jury queries Harvard student, programmer.

145 HP tries to liven things up with three new divisions.

SYSTEMS & SOFTWARE

29 HP braves new world of computer superconductors.

29 VSE users feel reprieved from forced exodus to MVS.

29 Computer Associates adds Supercalc to lengthening list of VAX products.

LAN expectations heating up. Page 83.

MICROCOMPUTING

43 IBM publishes guide to OS/2.

43 Apple teams with integrators to better serve large corporate accounts.

43 Mac digs in on archaeological expedition.

NETWORKING

59 Comdex stokes blaze of networking standards endeavors.

59 Carriers are already working to shatter the 1M bit/sec. ISDN speed barrier.

59 How well will OS/2 LAN Manager and OS/2 LAN Server get along?.

59 Automotive competitors dish it out.

MANAGEMENT

111 Former Pillsbury exec to build on United Technolgies' MIS groundwork.

111 TV station MIS chief yearns for gray hair.

111 Increasingly prominent quality assurance posts now draw quality salaries.

Quotable

"You can tell people that they have crummy locks, but you can't make them change them."

CLIFF STOLL
HARVARD UNIVERSITY

On failure of many users to heed Internet warning that could have prevented virus spread. See story page 145.

COMPUTER INDUSTRY

119 Andersen consulting celebrates independence day.

119 Japan won't buy U.S. chip allegations.

119 Study lauds industry for Silicon Valley cleanup.

119 Local operating nets to regulate variety of devices.

COMPUTER CAREERS

125 Integrating DEC and IBM can make you rich and famous but also very tired.

TRAINING

141 Chargeback strategy entails sharing overhead, collecting course fees.

TRENDS

146 IBM's dominance in leasing market is slipping.

PRODUCT SPOTLIGHT

83 LAN users are starting to develop appetite for stronger applications fare. By Josh Brackett.

IN DEPTH

101 How to control a PC software inventory run amok. By Irv Brownstein.

OPINION & ANALYSIS

21 Manzi calls for redirection to free industry from its aimless orbit.

29 Hamilton stares down the two faces of IBM.

43 Barney peeks behind mask of "Meanie Manzi."

59 Keefe exhorts Apple to put out or shut up.

111 Reed bemoans the status of the status report.

119 Wilder wishes for smoother industry-investor communications.

DEPARTMENTS

8 News Shorts

20 Editorial

25 Book Reviews

114 Calendar

135 Marketplace

143 Stocks

146 Inside Lines

Watchdogs oppose FBI database growth

BY JAMES DALY
CW STAFF

PALO ALTO, Calif. — Ever get the feeling you're being watched? A group of social watchdogs fear those pangs of uncertainty could get a lot worse before they get better.

Last year — in an effort to trim what they said could grow into a civil rights-trampling attempt by the Federal Bureau of Investigation to monitor people's lives — the Computer Professionals for Social Responsibility (CPSR) and the American Civil Liberties Union (ACLU) teamed up to oppose the scope of the FBI's planned expansion of its National Crime Information Center, or NCIC, database.

Although the FBI has since put out a few fires by lessening the scope of the original expansion plans, a recent debate at Stanford University between the civil libertarians and the FBI proved that wide areas of disagreement still remain.

> "IT COULD be extremely unwise to trust computer systems with the protection of critical data."
>
> PETER NEUMANN
> SRI INTERNATIONAL

"We need to make sure . . . the FBI is acting responsibly," said Jerry Berman, the ACLU's chief legislative counsel, who was part of a panel that debated with William Bayse, the FBI's assistant director of technical services, over the extent that the NCIC should be allowed to expand.

Chief among the CPSR's areas of concern are the FBI's ability to maintain the security and integrity of the database.

"One of the reminders given by [last month's] Internet worm is that most computer systems have serious security vulnerabilities, especially from within," said Peter Neumann, a computer scientist at SRI International, a Menlo Park, Calif., not-for-profit research institution, and a member of CPSR. "It could be extremely unwise to trust computer systems with the protection of critical data."

Sensitive subjects

CPSR's effort has concentrated on user identification and access issues, particularly those involving sensitive data queries. Listings of drug informers, for instance, could be devastating if they fell into the wrong hands, Neumann said.

Two years ago, the FBI announced plans to expand its central files and solicited suggestions from law enforcement officials. Among the more than 240 items on the resulting wish list were requests for expanding the database to include information on credit-card transactions, telephone calls, airline passenger lists and enlarging the extent to which nonpublic information — such as ongoing investigations — could be included in the NCIC.

Initial objections to the scope of the expansion forced an FBI advance policy board to withdraw many of the controversial suggestions, but the ACLU and CPSR thought the cuts were not deep enough. Rep. Don Edwards (D-Calif.), who heads a House subcommittee on civil and constitutional rights, suggested forming independent panels, some including members of the CPSR, to study the move and issue recommendations before moving ahead. Those reports are expected early next year.

Law enforcement officials use the NCIC's 19.4 million files more than 700,000 times a day to check on everything from routine traffic violations to Peace Corps applicants. Although Bayse said the bureau spends $1 million a year auditing the 20-year-old system, he admitted that with so many queries a day, "a lot of things can happen."

The wrong man

Critics cite the case of Terry Dean Rogan, a Michigan man arrested five times for crimes he did not commit after his wallet was stolen and he was mistaken for a murder suspect who had used his identification. Rogan eventually received a $55,000 settlement from the city of Los Angeles for failure to remove his name from its database.

The NCIC system has 12 main files containing information on criminal arrests and convictions, missing persons, people with an outstanding arrest warrant, stolen vehicles and persons suspected of plotting against high-level government officials. The setup fills a room half the size of a football field at the FBI's headquarters at the Hoover Building in Washington, D.C.

FBI Director William Sessions is expected to wait until the Bush administration takes office before announcing the extent of the system's expansion.

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IBM treaty

FROM PAGE 1

in the U.S. wants IBM compatibility, Gens said, and "the way to maintain IBM compatibility is by defining an IBM operating system."

Spokesman from both National Advanced Systems and Amdahl Corp. said the settlement will have no significant effect on their companies.

Reaction differed as to whether Fujitsu will be able to leverage its access to proprietary IBM information to compete with an IBM-compatible MVS look-alike or whether it will glean information to keep pace with the increasingly sophisticated design of IBM mainframes.

Independent analyst Frederick Withington said the software itself is not the issue. "Fujitsu only wants to be sure that it can offer hardware compatible with IBM's operating system, which is the heart of this guarantee," he commented.

Withington described the secured facility regime — which permits Fujitsu personnel not involved in software development to look at source code but not to bring it out of the secured facility — as insufficient for the needs of software developers. He said such procedures will permit Fujitsu only to make sure that its hardware matches IBM's code.

Despite the advantage for Fujitsu, Withington added that "IBM will always have its couple of years' time advantage, because Fujitsu can only access announced software."

Withington contended that the decision merely keeps the industry dynamics the same. "Fujitsu has kept good hardware partly by means of secret payments to IBM," he said. "IBM is permitting Fujitsu to continue doing what it has been doing." Arbitrators last week said Fujitsu has already paid IBM more than $400 million for use of proprietary information.

Fujitsu options in doubt at home

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — As Japanese industry continues to assimilate the impact of Tuesday's landmark settlement of the Fujitsu Ltd./IBM copyright battle, the recurring question is whether Fujitsu will be able to adequately maintain compatibility with IBM 370 mainframe software.

IBM's partially open kimono has brought up more questions than answers in Japan. Japanese press reports speculate that Fujitsu, which has had a better degree of IBM compatibility than Hitachi Ltd. because of its reverse-engineering policies in the past, will now be brought on par with all the other plug-compatible mainframe makers.

This is because the settlement gives Fujitsu access to interface information — that is, what a program does rather than how it does it.

This means Fujitsu would have to apply more work and more development time to creating software from the interface data than in the past, when it relied on some copied IBM specifications.

"The market thinks Fujitsu will have trouble making compatible software," said Kiichi Maesato, an analyst at James Capel Pacific Ltd. in Tokyo. "Fujitsu has been guaranteed a compatible business. Whether it can come up with software programs is up to Fujitsu. What is not clear is how much Fujitsu is limited. There is a lot of speculation that IBM will not give out [information on] new and innovative products."

There is already evidence of Fujitsu's slip in compatibility. "In the past year we had trouble running [our software] in the Fujitsu environment," explained Yoichi Nishijima, director of Ashisuto K. K., one of the largest software companies in Japan.

Ashisuto's key business, selling portable software that runs on Fujitsu and IBM mainframes, makes up 70% to 75% of its revenue. "We've had a hard time keeping portability," he said. "At one time, one software product could run in both the Fujitsu and IBM environments."

Hand in glove

IDC's Gens and Bob Djurdjevic, president of Annex Research in Phoenix, disagreed. "This judgment deals with where the operating system meets the application," Gens said, "not where it meets the hardware."

Djurdjevic said both hardware and software are at issue because the two go hand-in-glove. Indeed, Djurdjevic said that the ability to examine manuals and source code will enable Fujitsu over the long term to bring "an operating system closer to IBM's MVS to the U.S."

Nevertheless, Djurdjevic said Fujitsu will only be able to "bring the operating system to the U.S. piecemeal; it can't start for at least two years."

The strict procedures outlined in the decision signal that Fujitsu's examinations will be a painstaking process, with each step closely monitored by an American Arbitration Association panel. The arbitration limits Fujitsu's access to interfaces that describe what the program does but not how it does it.

Despite what observers hailed as a thorough arbitration, Gens said Fujitsu will try to get access to information that details the specifics of how the interfaces operate.

"IBM will try to move the interfaces further away from the operating system than Fujitsu would like, and Fujitsu will argue over definitional issues," he said. Fujitsu will also argue over costs, because the judgment has laid out only guidelines, he added. Gens contended that such disputes could delay Fujitsu's ability to bring software to market.

John Imlay, chairman of Management Science America, Inc., said the $833.2 million settlement "recognizes in a public forum that software and intellectual property have worth."

However, like others, Imlay said he wants to see the next battle settled in court.

That does not appear likely. According to Milton Wessel, special counsel to ADAPSO and adjunct professor of law at the Georgetown University Law Center, "More important than IBM getting a few bucks is that an unorthodox arbitration procedure has devised a solution that may well set a de facto precedent for settling such disputes outside a court of law."

Who do you trust?

When independent arbitrators John L. Jones and Robert H. Mnookin took center stage once again last week to map out the future of mainframe operating systems, a hypothetical question ran through the industry: Would you trust your technology-licensing dispute to these men?

When two companies agree to settle their differences by arbitration, as IBM and Fujitsu did in 1983, the arbitrators assume vast powers of control and need not foilow any precedents of statutory or case law or even previous arbitration rulings. Indeed, Jones and Mnookin have often stated that their goals are global market competition and customer benefits and that their decisions may not track with existing copyright law.

To some observers, the IBM-Fujitsu settlement, first announced in September 1987 and further detailed in last week's announcement, illuminated the pitfalls of arbitration. Although the global antagonists saved several man-years of court proceedings and legal bills, they essentially have placed themselves in the hands of Jones and Mnookin until the year 2002.

"The whole point of going to arbitration is to settle the matter quickly and get on with business," said John Logan, vice-president of Boston-based market research firm Aberdeen Group and a former consultant to IBM in the 1970s. "But in this case, third parties will continue to manage the relationship between these two giants for a long time," Logan added. "It's the most bizarre result of arbitration one could have imagined and will tend to make people think twice about it."

On balance, the decision to submit disputes to arbitration — like all major corporate decisions — involves a trade-off. Is the time and money saved by avoiding a courtroom battle worth the risk of an unfavorable arbitrator's ruling — one which the firm has no recourse to change?

IBM released a statement saying it was pleased with the settlement terms. But observers wondered whether IBM now regrets the arbitration course.

"I think IBM's legal costs for Fujitsu would have been minimal compared to the Department of Justice case," Logan said, referring to the U.S. government's marathon antitrust suit against IBM in the 1970s.

CLINTON WILDER

Small potatoes

IBM stockholders won't find any presents from Fujitsu under their Christmas trees.

With more than $50 billion in revenue, IBM is just too big to reap any significant bottom-line benefits from Fujitsu's software access payments. Payments that Fujitsu has already made have been included in "other income."

According to Nikko Securities Co. analyst Michael Geran, the "other" income category has already been averaging about $300 million per quarter. "For anybody else, half a billion dollars [over the course of the 14-year settlement term] would be a big deal," Geran said, "but not for these guys."

CLINTON WILDER

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News Bureous
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201/967-1350

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202/347-6718

Mitch Betts, Bureau Chief

West Coost
415/347-0555

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312/827-4433

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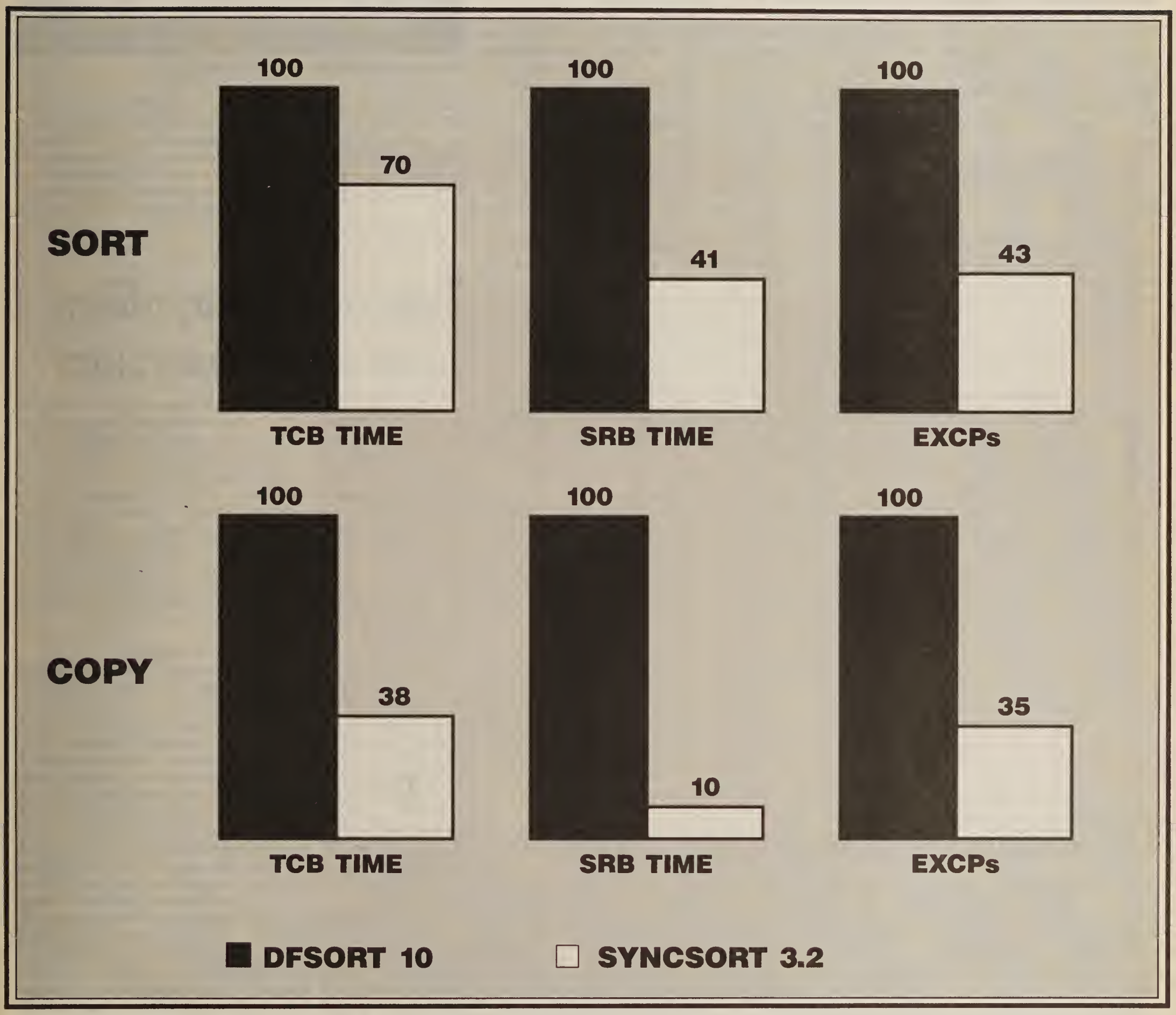

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DEC's PC commitment doubted

BY WILLIAM BRANDEL
CW STAFF

Is DEC serious about PCs? That's what many observers were wondering last week after a Digital Equipment Corp. press conference intended to pump up the vendor's desktop strategy failed to make any mention of Microsoft Corp.'s MS-DOS or demonstrate serious commitment from the personal computer software community for DEC's Decwindows strategic user interface.

The meeting drew executives from four top PC software firms for a promised show of support for Decwindows, which is slated to run under DEC's VMS and Ultrix as well as MS-DOS. However, few concrete plans were announced, and DEC officials later admitted that MS-DOS was not mentioned at all because of an "oversight."

Last week's event contrasted starkly with DEC President Ken Olsen's statement in August that MS-DOS would play a big role in the company's desktop strategy, which he said would be unveiled at the end of this year.

Absent from the conference was an expected product announcement for the VAX from Lotus Development Corp. DEC and Lotus announced a marketing and development agreement the previous week, but Lotus Chairman Jim Manzi stated that while Lotus would support a version of 1-2-3 for the VMS version of Decwindows, he would not say whether any product is currently under development.

"The world is a mess as far as user interfaces go," Manzi said.

Although Adobe Systems, Inc. is supplying Display Postscript extensions to Decwindows for the VMS and Ultrix versions, company President John Warnok said that the company would not develop an actual application for Decwindows until that product was "robust enough." Nor would Warnok or any of the other panel members say that they preferred Decwindows to Microsoft's Presentation Manager.

Smokescreen

When pressed, DEC officials would not demonstrate any concrete evidence that MS-DOS vendors are developing applications for the DOS windowing system.

Throughout the briefing, DEC omitted any reference to Decwindows/DOS, which is due out early next year. The DOS windowing system would allow PCs in a VAX environment to pop up window files from VMS and Ultrix-based systems.

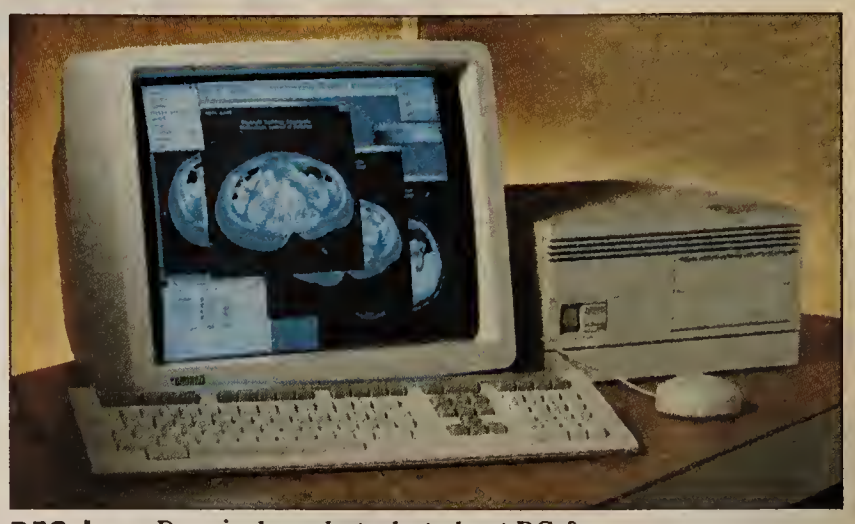
Instead of emphasizing windowing on PCs, DEC officials repeatedly touted XUI, the X Window System interface it is pushing as the standard for the Open Software Foundation.

Afterward, DEC Vice-President of Business and Office Information Systems Henry Ancona said technical problems are blocking the introduction of the DOS version of the windowing system, which he added would be announced some time after the VMS announcement slated for late February.

However, a source close to the Decwindows/DOS program said that the project is ahead of schedule. Analysts said DEC has held back the product because its MS-DOS support is weak.

"What DEC demonstrated for everyone here today is that although DEC needs DOS software support, it has very little to speak of," said John Logan, vice-president of the Aberdeen Group, a Boston-based research firm.

DEC acknowledged that Decwindows/VMS and Decwindows/Ultrix would both be shipping by late February. A spokesman said that a new version of the VMS operating system needed to support the windowing system would also debut in February.



DEC does *Decwindows, but what about PCs?*

PVAX in January

In a major desktop announcement slated for Jan. 10, DEC will introduce the so-called "PVAX," a company source said. The PVAX is a single-user system that will reportedly run VMS, MS-DOS and Ultrix. Another source, Terry Shannon, a DEC analyst at International Data Corp. in Framingham, Mass., predicted the PVAX will be called the Vaxstation 3000, will be based on the Microvax 3300 and 3400 CPUs and will be priced at $7,000 to $8,000 for an entry-level configuration.

The DEC source said that the firm will also formally announce Decwindows, including pricing and availability, as well as "VAX Image Services," the company's response to Wang Laboratories, Inc.'s and IBM's imaging systems.

Shannon predicted that DEC will announce another workstation on the same day that incorporates the Mips Computer, Inc. reduced instruction set computing microprocessor. Shannon said the workstation will be capable of 10 million instructions per second. It will run only Ultrix, however.

STANLEY GIBSON

Token-ring suppliers form own consortium

BY PATRICIA KEEFE
CW STAFF

BURLINGAME, Calif. — A rebellion has broken out among token-ring suppliers chafing under IBM's dominance — and at times, circumvention — of the IEEE 802.5 token-ring standard.

The revolt is spearheaded by the Open Token Foundation (OTF), a newly formed consortium dedicated to interoperability among token-ring products.

Rebel leaders 3Com Corp. in Santa Clara, Calif., and Madge Networks Ltd. in London have scheduled a press conference tomorrow to discuss the results of an initial organizational meeting to be held today.

Much as the Open Software Foundation grew out of a rejection of AT&T's grip on the Unix standard, so the OTF smacks of resistance to a perceived IBM dominance of the 802.5 token-ring standard.

"Is the token-ring an open standard or not?" asked Robert Madge, founder of Madge Networks, who claimed IBM has been controlling the standard. "We hope to answer that."

The foundation's current membership comes from the vendor community, but plans are to recruit members from among users who have large token-ring investments and who are in a position to "lay down their requirements to IBM," Madge said.

User interest is expected to be kindled by efforts to interconnect departmental networks. This is where interoperability glitches can become serious problems in a hurry, said William Swift, 3Com's product line manager for the token-ring.

At press time, IBM was still evaluating whether to join the group or attend today's meeting. A spokesman described IBM's outlook toward the consortium as "favorable."

OTF participants include Network General Corp., Western Digital Corp., NCR Corp., Proteon, Inc., Sytek, Inc., National Semiconductor Corp. and Architecture Technology Corp. More names are expected to be announced tomorrow.

90% control

According to 3Com and Madge, IBM controls 90% of the token-ring market. "By default, its hardware and software define the standard for compatibility," said 3Com founder Robert Metcalfe, who is also chairman of the Corporation for Open Systems.

Leeway in the standard allows design decisions that fall within 802.5 yet produce a product that will not work with other token-rings, Swift said. IBM has enhanced its 4M bit/sec. Token-Ring in ways that deviate from the IEEE standard. These kinds of deviations among products have undermined user confidence in their ability to mix and match standards-based equipment, Madge claimed.

"We want a stable standard and one that is a little more controllable than what we've seen," Swift agreed.

Using "straightforward pressure," the OTF will work to ensure interoperability between token-ring implementations, Madge said. While it will not provide conformance testing, it will promote compliant products to the user community.

The consortium will also explore development of a standardized method for bridging between Ethernet and token-ring.

Two challenge token-ring claim

BY PATRICIA KEEFE
CW STAFF

The holder of the token-ring patent is facing his first court challenges — on both sides of the Atlantic.

Despite successfully executing 36 licenses worldwide, patent holder Olof Soderblom has failed to convince two token-ring suppliers — Apollo Computer, Inc. in Chelmsford, Mass., and Madge Networks Ltd. in London — to acquiesce to demands that they acquire a license.

In response, Soderblom and his company, Willemijn Holding BV in the Netherlands, filed suit earlier this year against both firms. This is the first public acknowledgment of the Apollo suit. Neither suit has been assigned a court date.

Previously, Soderblom had filed suit against two other UK firms, but one went out of business and the second was settled out of court, according to George Vande Sande, Willemijn's patent counsel and a partner with Pollock, Vande Sande & Priddy in Washington, D.C.

As noted by Apollo in a prepared statement, there has never been a court decision validating the Soderblom patents, nor has any court ever declared that Apollo or any other party has infringed on those patents.

Although a number of the licensees were slow to come to the bar, Willemijn is suing Apollo because "it became apparent after numerous discussions that further negotiations were fruitless," Vande Sande said.

The suit against Apollo seeks an injunction against further infringement of the patents, along with triple damages resulting from the alleged infringement. Apollo, which offers 4M and 12M bit/sec. token-rings, has filed a counterclaim asking the court to invalidate the Soderblom patents and to declare that no infringement has occurred.

There is no mechanism for countersuing in the UK, said Robert Madge, founder of Madge Networks, which makes an 802.5 standard token-ring. But Madge also disputed the validity of Soderblom's patents and claimed it does not apply to 802.5 technology: "We don't believe it's necessary to have a license from Olof Soderblom to have a token-ring product."

There is speculation that Soderblom is revealing the Apollo suit now to influence discussions under way with another 15 potential licensees.

Apple token-ring in New Year?

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Where is Apple Computer, Inc.'s version of IBM's Token-Ring?

That question is being asked by MIS directors at large corporations. Apple customers like Jeff Ehrlich, an MIS manager at General Electric Co.'s medical services group, have placed token-ring on their Christmas lists. GE, which buys more of Apple's Macintosh personal computers than any other firm right now, has standardized on the IBM local-area networking scheme.

It looks like Apple will not be able to fulfill Ehrlich's Christmas wish. Apple had promised to introduce a token-ring adapter card by the fall. With only three weeks to go, it does not look like Apple will make good on its word.

Current estimates call for Apple's token-ring card to debut in the first half of 1989. IBM has already improved its Token-Ring, recently introducing a version offering 16M bit/sec. transmission.

Apple had little to say about its token-ring efforts last week. "It hasn't been officially announced, so it can't be considered late," said Rick Myllenbeck, an Apple spokesman. "Everybody knows token-ring is important to Apple."

However, in an earlier interview, David Nagy, Apple's marketing manager of IBM host communications, said Apple will be seriously affected if it cannot get its token-ring out the door by early 1989.

"I don't believe we've lost out on a lot of accounts yet," Nagy said during that interview. "If we don't have it out by early 1989, we will." Attempts to contact Nagy were unsuccessful.

Gerald Malec, vice-president of business marketing at Apple, said that the Mac has not been accepted at many large corporations because it lacks IBM 3270 (terminal) and Token-Ring applications.

Technical problems have apparently hindered the introduction. "Token-ring is complicated," explained Tim Turnpaugh, executive vice-president of Seafirst Corp., a Seattle subsidiary of Bankamerica Corp. Apple officials have declined to comment on any difficulties.

Needed for the 'big time'

Customers with a large installed base of IBM equipment said they look forward to Apple's token-ring card. "We live in an IBM world," Turnpaugh said. "Token-Ring is becoming more of a standard in IBM shops. If Apple wants to play in the big time, they need it."

Turnpaugh said Apple's token-ring will allow Seafirst to be more consistent in its operations. "We have so many LANs here, I think they're like rabbits," he quipped. "They multiply overnight.

"It ends up costing us," he continued. "We can't do as much interchangeability of applications, we need to train people on the different systems and we need to dedicate people to manage them."

Token-ring is the fastest growing LAN technology, according to Dataquest, Inc., a San Jose, Calif., market research firm. Dataquest reported that 636,000 token-ring PC LAN connections will be shipped next year, representing 34% of that market.

Nina Burns, vice-president of Infonetics, Inc., a Santa Clara, Calif., market research firm, said token-ring is crucial if Apple wishes to break into IBM shops.

"Token-ring is mostly present in large IBM environments," Burns said. "In terms of raw connectivity, a lack of token-ring applications is the biggest hole in Apple's product line."

TI announces 16M token chip

BY PATRICIA KEEFE
CW STAFF

HOUSTON — Texas Instruments, Inc. said last week that it will introduce today an IBM-compatible 16M bit/sec. token-ring chip set featuring a single processor.

The chip set is slated for delivery in March, and many third parties are targeting second-quarter shipments of 16M bit/sec. token-ring products.

The TMS380C16 chip set reportedly provides the following key improvements over TI's previous 4M bit/sec. chip set:

- A simplified design that uses one chip, compared with the five currently needed.
- The option of 4M or 16M bit/sec. speed on the same card.
- Up to 260 active stations per ring, concurrent support for over 254 link stations and 126 service access points.
- An increase, up to 2M bytes, in buffer memory and a full 32-bit address.
- Frame sizes up to 18K bytes, vs. Ethernet's 1,500-byte maximum. An early-token-release option will circulate multiple frames around the ring simultaneously.
- An extensive array of media access control network management services.
- Reduced area and power requirements, which support production of compact personal computer motherboards and use in low-power applications.
- Lower costs due to less silicon.

Like its predecessor, the 16M bit/sec. communications network processor will maintain compatibility with IBM's Token-Ring and the IEEE 802.5 and 802.2 standards, TI said.

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NEWS SHORTS

Backup service a little late

A backup service introduced by AT&T last week would have greatly diminished the impact on leased-line customers of the recent severing of AT&T's East Coast fiber-optic link, the company said. Network Protection Capability, which is scheduled for availability Jan. 13, automatically switches Accunet T1.5 and T45 service links to a backup facility when the primary link goes down, AT&T said. The Network Protection backup lines are always on a different cable to ensure that primary and backup links are not severed by the same disaster, as happened with the East Coast fiber-optic cable break, an AT&T spokeswoman said.

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DEC, EMC Corp. joust again

Digital Equipment Corp. and Hopkinton, Mass.-based EMC Corp. may be on their way to court again. This time, it is EMC in the plaintiff's seat. EMC charges that DEC divulged the terms of the companies' 1987 settlement agreement, which was not only supposed to be confidential but also under a court-imposed seal. The U.S. District Court is a court of last resort for EMC, said Senior Vice-President W. Paul Fitzgerald, who added that friendlier attempts dating from October 1987 to get DEC to own up and pay up went unheeded. "We will go to great lengths to avoid lawsuits. . . . We finally realized that the only way we could get them to seriously consider our position was through this legal action," Fitzgerald said.

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Armstrong named to IBM board

IBM's C. Michael Armstrong, considered by many a potential candidate for the IBM chairmanship, was named last week to the IBM Management Committee, the company's highest echelon executive body. Currently chairman of the IBM Europe/Middle East/Africa Corp., Armstrong will relocate from Paris to Armonk, N.Y., and add responsibility for the World Trade Americas Group and the Asia/Pacific Group. On the Management Committee, he replaced IBM Vice-Chairman Kaspar V. Cassani, who said he plans to retire next year. Other Management Committee members are Chairman John Akers, Vice-Chairman Jack Kuehler and Senior Vice-President Frank Metz.

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Micropro to slice work force

Micropro International Corp. in San Rafael, Calif., maker of the Wordstar word processing package, will reorganize to cut costs, including chopping 60 jobs, or 19% of its U.S. work force. President and Chief Executive Officer Gari Grimm said a new management team at Micropro was determined to bring costs in line with sales, which have been flat for three years. The moves are expected to save $3 million annually.

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Schools can get free DEC licenses

DEC will grant licenses to colleges and universities at no charge for virtually all of its software on which it pays no royalties. DEC said the Campuswide Software License Grant Program covers 160 products, including the VMS and Ultrix operating systems. Also included are networking software, computer-aided software engineering tools, database tools and office automation software. Under the associated Campus Service Agreement, DEC is offering a 75% discount on service to educational institutions that perform self-maintenance.

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Lottery contractor investigation

California state officials are investigating whether a contractor that provides computer services for the state lottery covered up downtime to avoid penalties. Gtech Corp. in Providence, R.I., is two years into a five-year contract to provide hardware and software for California's Lotto games. The state can fine Gtech $4,000 per minute for systemwide lapses. Two lottery employees alleged that Gtech falsified computer downtime reports and that the lottery administration knew of the falsification. Gtech refused to comment. The state controller's office is investigating, while the lottery agency itself is expected to report this week that there is no basis for the allegations.

A group by any other name . . .

BY AMY CORTESE
CW STAFF

The association of AT&T Unix System V licensees formerly known as the Archer group went public last week with a new name — Unix International, Inc. — and announced a chairman and new members.

Donald J. Herman, a recently retired senior executive at NCR Corp., will act as organizing chairman for the group. Herman is no newcomer to open systems, having been instrumental in the founding of the Corporation for Open Systems, a research and development organization for communications standards, before joining NCR.

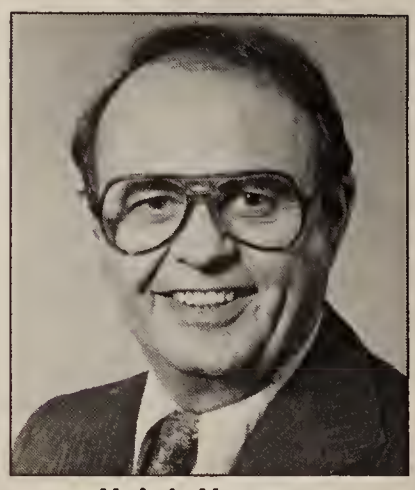
Herman said in an interview last week that the position is not permanent for him but that he will stay as long as it takes to accomplish the group's objectives. Herman said he thought he would have a replacement by April or May next year.

Assembling a permanent staff and finalizing the group's operating policies are Herman's primary objectives for Unix International. Positions will be filled by April, he said.

Well down the road

Much headway has already been made on detailing operating policies. Herman indicated that at least 25 policy papers prepared by member task forces are undergoing final approval.

Unix International will have three tiers of members, distinguished by how much they pay and voting privileges. Principal members will pay $500,000 per year, entitling them to representation on all committees.



Unix's Herman

General members will pay $100,000 per year and associate members $10,000, with proportionate representation. Principal members will be represented on a one-for-one basis, while general members will elect a specified number from their ranks to represent all general members.

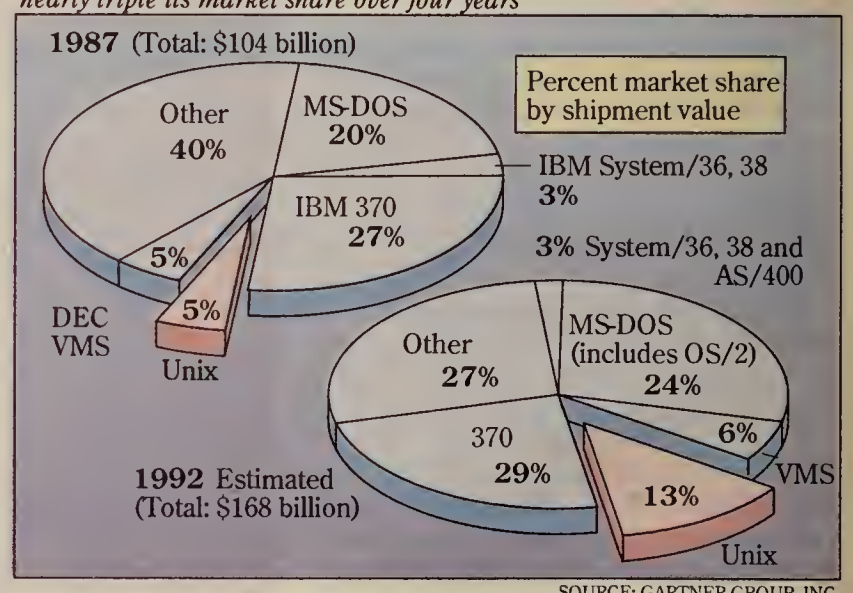
Principal members are Unisys Corp., Fujitsu Ltd., Sun Microsystems, Inc., NCR, AT&T, NEC Information Systems, Inc., Ing. C. Olivetti & Co., International Computers Ltd., Amdahl Corp. and Toshiba America, Inc.

Several firms have joined since the initial formation of the Archer group, bringing the number of members to 29. New members include Arix Corp., Concurrent Computer Corp., Texas Instruments, Inc., Data General Corp. and Oracle Corp. The group is expected to set up headquarters in New York.

The name Unix International was chosen because "it describes exactly what we're about," Herman said. The association's charter, he said, is "to protect users' investments in System V by ensuring that future development will keep that operating system as the industry standard" as well as ensuring that design decisions for Unix System V are independent of any particular vendor and that licensing is equitable for all.

From small beginnings

Unix combatants are vying for an operating system that is expected to nearly triple its market share over four years



SOURCE: GARTNER GROUP, INC.

OSF/AT&T rift hardens

BY AMY CORTESE
CW STAFF

Any hopes of a near-term agreement between the Open Software Foundation (OSF) and AT&T were dashed last week when the OSF sent a letter to members stating that negotiations with AT&T had been suspended. Talks between the two about cooperating on a standard version of Unix have been at a stalemate for several weeks.

The letter, signed by Henry Crouse, the OSF's interim president, said that AT&T's insistence that Unix System V, Release 4 be the OSF base operating system goes against OSF's founding principles and remains the obstacle to AT&T joining OSF.

"I have reached the conclusion that further discussions with AT&T would be nonproductive and have decided to suspend them," the letter read. There may be cause for some optimism, however: While the original wording of the letter said negotiations had been "terminated," that word was changed to "suspended," said Donal O'Shea, vice-president of operations at OSF.

The news seemed to catch AT&T by surprise. "The action is news to us," said William Klinger, division manager at AT&T responsible for Unix product management.

Regrets

Also, Lawrence Dooling, president of AT&T's Data Systems Group, remarked, "At the last meeting with OSF, we left the door open for further discussion. We are sorry OSF is closing it."

O'Shea claimed the break in negotiations was mutual. "Unix International is a clear indication that they have no intention of coming to terms with us," he said.

The letter addressed other issues besides the status of negotiations. Members were assured that OSF/1, the OSF's first scheduled product release, will be compatible with the two major Unix variants, Unix System V, Releases 3 and 4, and the University of California at Berkeley's Unix 4.2 and will provide System V Streams, AT&T's networking technology. O'Shea said compatibility with Microsoft Corp.'s Xenix, the third major Unix variant, will be up to individual OSF licensees.

O'Shea indicated last week that OSF's technical staff is close to a decision on the graphical user interface for use by OSF/1 and is investigating business terms for licensing arrangements.

OSF's user interface will be compatible with Unix System V, Release 4 and will be available on a stand-alone basis as well as with OSF/1.

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2: Donaldson, Lufkin & Jenrette report, July 18, 1988.
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COMPUTERWORLD

Adabas linked with ESA/MVS

BY AMY CORTESE
CW STAFF

RESTON, Va. — Software AG of North America, Inc. has committed itself to deliver a version of its Adabas mainframe database management system in the first quarter of 1989 to work with IBM's most advanced operating system, ESA/MVS.

By March 1989, Adabas and IBM's DB2 Version 2, which became available in October, are likely to be among the few products that will be able to take advantage of data spaces, or virtual memory devoted to data, and other Enterprise Systems Architecture capabilities.

Early ESA users have said that the new operating system improves the performance of applications running under it by an estimated 12% to 14%. Other mainframe-based DBMS vendors have said that their products will also eventually run on ESA and will make use of its features in 1989.

Computer Associates International, Inc. said that the current release of Datacom/DB, the DBMS it recently gained with the acquisition of Applied Data Research, Inc., now supports ESA and that the next release, due in the second quarter of 1989, will exploit ESA features. Computer Corporation of America (CCA) also said that the Model 204 now runs on ESA but will not make use of ESA's specific features until 1990. However, CCA claimed its DBMS avoids the disk I/O bottlenecks that ESA improves.

DB2 Version 2 includes features that benefit from ESA. However, some Data Facility Product parts of ESA/MVS were not scheduled to be available until this month.

Software AG's product line has been available on the new architecture for a month, but Adabas 5 will actually take advantage of ESA data space and hiperspace features that reduce required disk access, resulting in improved performance. Roel Pieper, vice-president of technology at Software AG, could not say exactly how much performance would improve but said he expects the entire I/O bottleneck to go away.

Exploiting ESA may just be a short-term marketing advantage, however, since all DBMS vendors will eventually support it and gain the same performance benefits, analysts said. Chris Bird, program director of software management strategies at the Stamford, Conn.-based Gartner Group, Inc., said that some DBMSs work more efficiently than standard operating system services.

Support slated for HP Openview

BY ELISABETH HORWITT
CW STAFF

BOSTON — Hewlett-Packard Co. is expected today to further define its network management platform and identify the first vendors to support its Openview network management interface.

Openview, which HP announced last March, defines a graphics- and windows-based user interface for network management systems and is founded on the Open Systems Interconnect (OSI) standard.

Companies that will jump on HP's network management bandwagon include Ungermann-Bass, Inc. and Northern Telecom, Inc., along with Fibercom, Inc. and two foreign vendors, said Frank Dzubeck, president of Communications Network Architects, Inc.

On the hot seat

LAN vendors are attracted to HP's network management platform because they are feeling pressure from their users to supply a centralized network management system and because HP has credibility as a supporter of the OSI standard, said Vince Barrett, a principal at Ernst & Whinney.

"To be honest, they may be in a position to truly and meaningfully drive an open interface" because, unlike companies such as Digital Equipment Corp., HP does not have a dominant market position to protect with proprietary protocols, Barrett said.

HP spokeswoman Laura Stiff, while refusing to confirm which companies would announce Openview support, said that today, "You will certainly hear more about support for Openview." She mentioned Northern Telecom and 3Com Corp. as likely supporters because both companies have unofficially made their own statements that they intend to support the network management interface.

UB confirmed that it has purchased an Openview developers kit from HP. Northern Telecom confirmed that it will integrate its Meridian Data Networking System with Openview. 3Com officials could not be reached for comment.

HP will map out a more definitive structure for its OSI-based network management platform, including distributed applications administration, systems operation and the management of multivendor communications equipment, Dzubeck said.

The vendor will also set out a schedule for migration of Openview from a proprietary system that manages HP equipment to run on top of Microsoft Corp. MS-DOS, then on OS/2 Presentation Manager, then on Unix, Dzubeck said.

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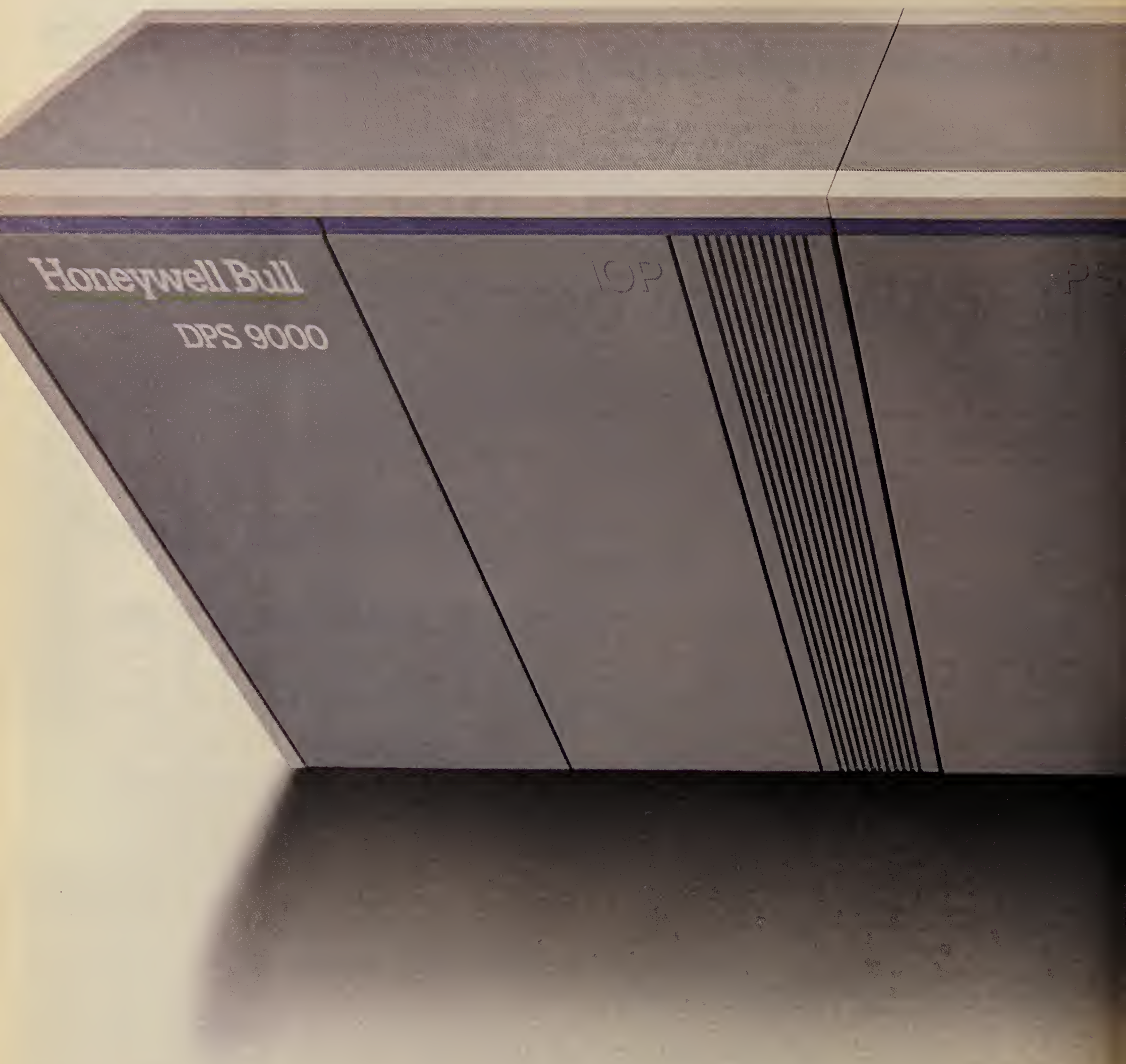

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Power Hungry.

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Honeywell Bull

Customers are more important than computers.

Tariffs feared from telecom conclave

BY JEAN S. BOZMAN
CW STAFF

Hundreds of telecommunications managers met at the bottom of the world last week to iron out a binding policy for international telecommunications standards that may reach into the pockets of U.S.-based companies.

The month-long World Administrative Telegraph and Telephone Conference (WATTC) in Melbourne, Australia, is meeting to regulate the world's public and private voice and data networks. Once finalized, the global agreements will be enforced by the United Nations' International Telecommunications Union (ITU).

Large U.S. corporations, many of which are fielding WATTC delegates, have worried that European nations will call for the imposition of tariffs on privately held corporate data networks. That would mean millions of dollars in fees paid to European Postal Telegraph and Telephone units, as would requirements to make the same private networks compatible with Open Systems Interconnect. Many of the largest global data networks are based on IBM's Systems Network Architecture.

> "THE IMPOSITION of tariffs on private networks would make them less attractive than public ones and more expensive to operate."
>
> HOWARD ANDERSON
> THE YANKEE GROUP

"The resolutions developed by the ITU hold treaty status through the United Nations," said Ken Phillips, chairman of the Committee of Corporate Telecommunications Users, which includes 30 of the largest U.S. firms. Phillips, a telecommunications manager at Citicorp, added, "You can take an exception to a treaty, but exceptions aren't granted too often.

"The European countries are arguing that telecommunications [over the private networks] amount to services that should be subject to tariffs by governments," Phillips explained. "Enforcing such a structure also implies a knowledge of the content of the data. So there are a number of issues with respect to privacy, intellectual property and copyrights."

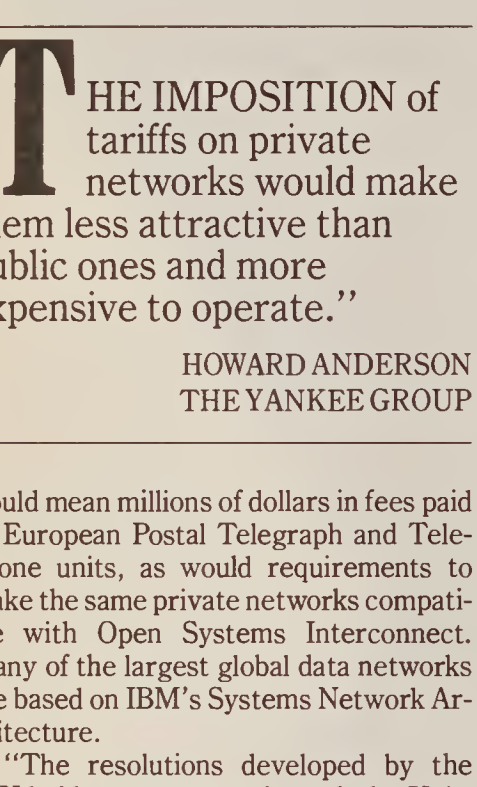
The prospect of changes in the international telecommunications rules clearly frightens many large multinationals. "The global corporation sits on top of its global network," said Howard Anderson, managing director of The Yankee Group in Boston. Anderson met last month with WATTC attendees in Australia. "The imposition of tariffs on private networks would make them less attractive than public ones and more expensive to operate," he added. Citicorp's global network, for example, reaches 70 countries.

Keeping tabs

A U.S. delegation of 29, including representatives from U.S. companies and government agencies, is monitoring the Australian debates. Among them are delegates from Citicorp, Pacific Telesis Group and the U.S. Department of State. WATTC, which began before Thanksgiving, is scheduled to end by Christmas.

Even if tariffs are imposed on private networks, most large multinationals will still prefer their private end-to-end networks over public networks, Anderson said. "The large MIS guys know they have to plan for things like this eventually," Anderson noted. "It'll just make it harder and more expensive to do business."

American Express Co. is among the companies monitoring the WATTC meeting with interest. "We've made our position known to the U.S. delegates," said an American Express spokesman in New York. The company did not send anyone to the conference, he said, adding that "we are always concerned about any changes that would affect our operating conditions worldwide." American Express has communications links in 100 countries.



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The Commercial Underwriter's Environment developed by Swiss Re Services automates decision making by reviewing several screens of data, gauging the level of risk, and recommending whether potential clients should be insured.

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Prime white knight mentioned

BY NELL MARGOLIS
CW STAFF

Prime Computer, Inc. turned down an offer; MAI Basic Four, Inc. turned up the heat; and a possible white knight appeared in the distance as MAI's hostile bid for Prime wound into its third week.

Prime's opening move last week surprised no one: It officially rejected the unsolicited $970 million offer from a wholly owned subsidiary of the small Tustin, Calif.-based computer company that only months ago unsuccessfully presented itself to Prime as a candidate for acquisition.

Citing outside opinions and hours of deliberation, Prime's board scorned the $20-per-share bid as reflecting neither the company's current intrinsic worth nor its potential value.

In addition, since MAI's Nov. 15 proposal, Prime has received "an unsolicited preliminary inquiry from a third party with respect to a possible negotiated business combination," according to Prime's mandated filing with the Securities and Exchange Commission.

As of the filing date early last week, however, Prime and its putative white knight, whose identity Prime declined to disclose, were engaged in no active discussions regarding a combination.

Industry speculation centered on Ford Motor Co. as the possible white knight. In addition to being a major Prime user with sufficient financial resources to be believable in the role, Ford could have a particular competitive impetus to buy Prime, said Gene Novacek, computer services director at St. Louis-based Alberici Corp. "Ever since General Motors bought EDS, I've been waiting for Ford to do something like this," he said.

White knight

John Dexheimer, a principal at Broadview Associates, a merger and acquisitions specialist firm based in Fort Lee, N.J., targeted "international firms — both computer vendors and industrial automation firms," as the cohorts likely to yield a white knight for Prime. "Ford much less so," Dexheimer said.

A Ford spokesman, citing the company's no-comment policy with regard to ongoing plans, was unable to either confirm or deny Ford's interest in Prime.

Meanwhile, as Prime urged its shareholders to hang on to their stock, MAI signaled that they might also do well to hang on to their hats: The California company and its chairman, New York investor Bennett LeBow, are not bowing out without a fight.

LeBow fired off a formal statement of disappointment with Prime's rejection of "our fair and fully priced offer" and turned his attention to Wall Street, which has thus far failed to find a significant amount of substance, synergy or even seriousness in the MAI bid. Today, LeBow is hosting an invitation-only meeting at which he will attempt to make MAI's case to selected analysts.

Soviets to swamp Sweden with PCs

BY MATS HEDBERG
IDG NEWS SERVICE

STOCKHOLM — The Soviet Union, reportedly with the approval of U.S. officials, plans to deluge Sweden with inexpensive personal computers. The first units, scheduled for delivery in March, will include an IBM Personal Computer AT compatible selling for about $1,250 and a PC XT compatible for about half that price.

The Soviets' shortage of hard Western currency and plentiful supply of cheap labor make these prices possible. Components in the PCs come from Asia and are being assembled at a plant in the Baltic provinces of the Soviet Union, keeping transport costs to Sweden low. Gradually, more of the components are to be produced in the Soviet Union until, ultimately, only the microprocessor will be imported.

The Soviet plant will produce 10,000 PCs the first year, with half tagged for export. The Soviets have an agreement with a U.S. company, Incorema, that has reportedly helped them and their business partners avoid breaking U.S. export control laws.

Lockheed Corporation's batch-mode system, MEDCHEC, reduced the workload of medical claims auditors and improved their effectiveness by automatically reviewing all claims and identifying the questionable ones for review.

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Bob Reynolds, Westinghouse Corporation

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Tom Roberts, Gateway Information Services, Swiss Re Services Inc.

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Banyan reaches for Mac

Uncrates Apple-to-IBM gateway integrated with Vines

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — A gateway said to facilitate electronic mail transfer between Apple Computer, Inc. Macintoshes and IBM Personal Computers was introduced last week by Banyan Systems, Inc.

With the help of technology from two third parties, Banyan claimed to have developed a link to the Apple world that is fully integrated into Banyan's Virtual Network System, or Vines.

This means Mac users can take advantage of Vines' capabilities, including X.25 and Transmission Control Protocol/Internet Protocol, for remote connections and gateways to mail systems from other major vendors, such as IBM's Professional Office System and Digital Equipment Corp.'s All-In-1.

The E-mail link is the first in a series of planned Apple connectivity products, said Mary Kirson, Banyan's director of product marketing. The next release of Vines, Version 3.1, which is scheduled for April delivery, will incorporate support for a number of key Apple connectivity protocols such as Adobe Systems, Inc. Postscript and Appletalk File Protocol.

The initial Mac product offering starts with E-mail because it turned up as the No. 1 application on the network in surveys of customer sites, Kirson said.

The server software-based Vines Mac Mail gateway reportedly provides Mac-to-IBM PC and Mac-to-Mac mail service over Vines.

One of a kind

Mail is actually exchanged between the Vines-based Network Mail and Des Moines, Iowa-based CE Software Co.'s Quickmail, which is said to be the only existing Macintosh mail package today that supports gateways.

There are two components: Listener runs as a Vines service on Banyan's Vines/386 or Intel Corp. 80386-based CNS servers and Bridge runs with the Quickmail Administrator program on a nondedicated Mac. The Macs are linked to Vines via Ethernet directly or an Ethernet-to-Apple Localtalk bridge.

Network Mail ties the Macs into other Vines services such as Streetalk and the security and management system. File exchange is supported by attaching files to E-mail messages.

The gateway is based on Berkeley, Calif.-based Starnine Technologies, Inc.'s Unix-based Mail Link gateway. It can reportedly send messages between Macs that are not located on the same physical network.

The gateway is set to be available in April for $795 per server.

AT&T extends 900 service to databases

WASHINGTON, D.C. — Starting next month, AT&T is extending its 900-number service to include interactive voice or data communication with information databases.

AT&T said recently it has filed with the Federal Communications Commission to sell its new Multiquest service to established information providers — or interested MIS organizations — to support ad hoc database queries. A voice-recognition system will support voice requests for data, while standard modems can be used to access data directly.

Up to now, according to Multiquest product manager Pat Lindblad, most information providers have required customers to subscribe to information services, limiting the potential market.

But Multiquest customers will post charges where they cannot be missed — on the end user's AT&T phone bill. The information provider will have to pay his own bill for Multiquest, including a $1,200 flat fee and a $1,000 monthly fee for each group of 900 lines supported.

AT&T filed a tariff with the FCC late last month so that it can start the service Jan. 5.

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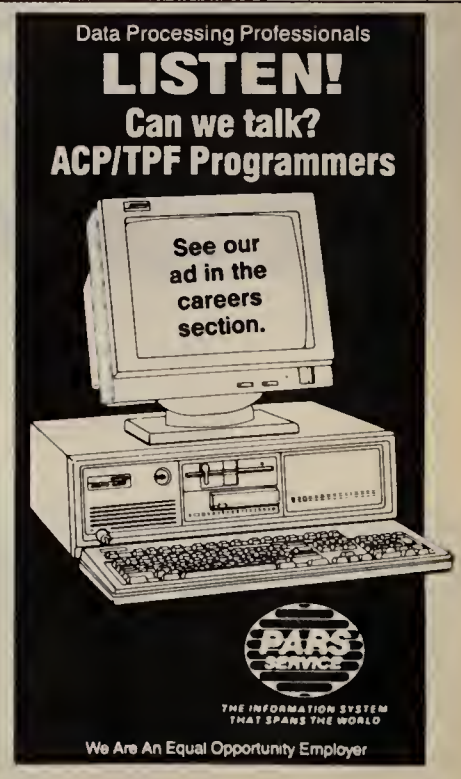

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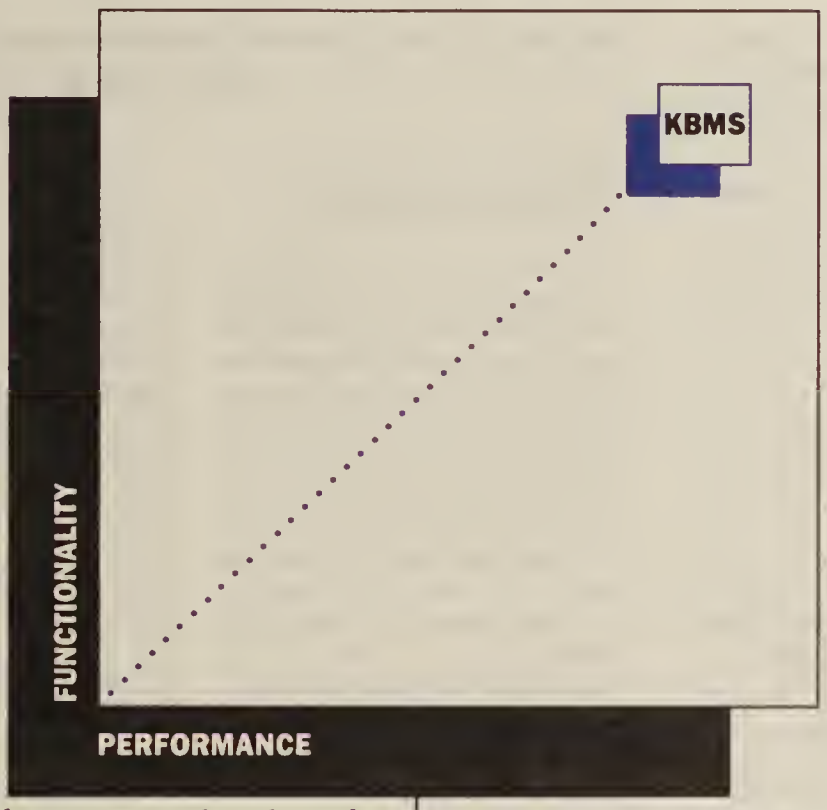

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EDITORIAL

The perception

CAN YOU IMAGINE growing your information systems budget by nearly twice the projected rate of inflation without having the ability to adequately measure the business value of projects being funded?

While corporate managers in engineering, sales or marketing departments may scoff at such a likelihood, a recent study [CW, Nov. 28] by Cambridge, Mass.-based Index Group has pegged average IS spending growth at big companies at 7.5% for 1989. But only 10% of the 240 senior IS managers polled say they've found ways to sufficiently assess the business value of their information systems.

How can this be, especially at a time in the economic cycle when budgets are coming under such microscopic scrutiny?

The answer appears to lie within a corporation's chief executive officer's *perception* of IS value, and therein lies some good news as well as some potential trouble spots ahead.

To approve such spending increases, the perspective of CEOs on the IS function is presumably growing in the right direction, in which systems strategies are increasingly tied to the overall performance of the company and its bottom line.

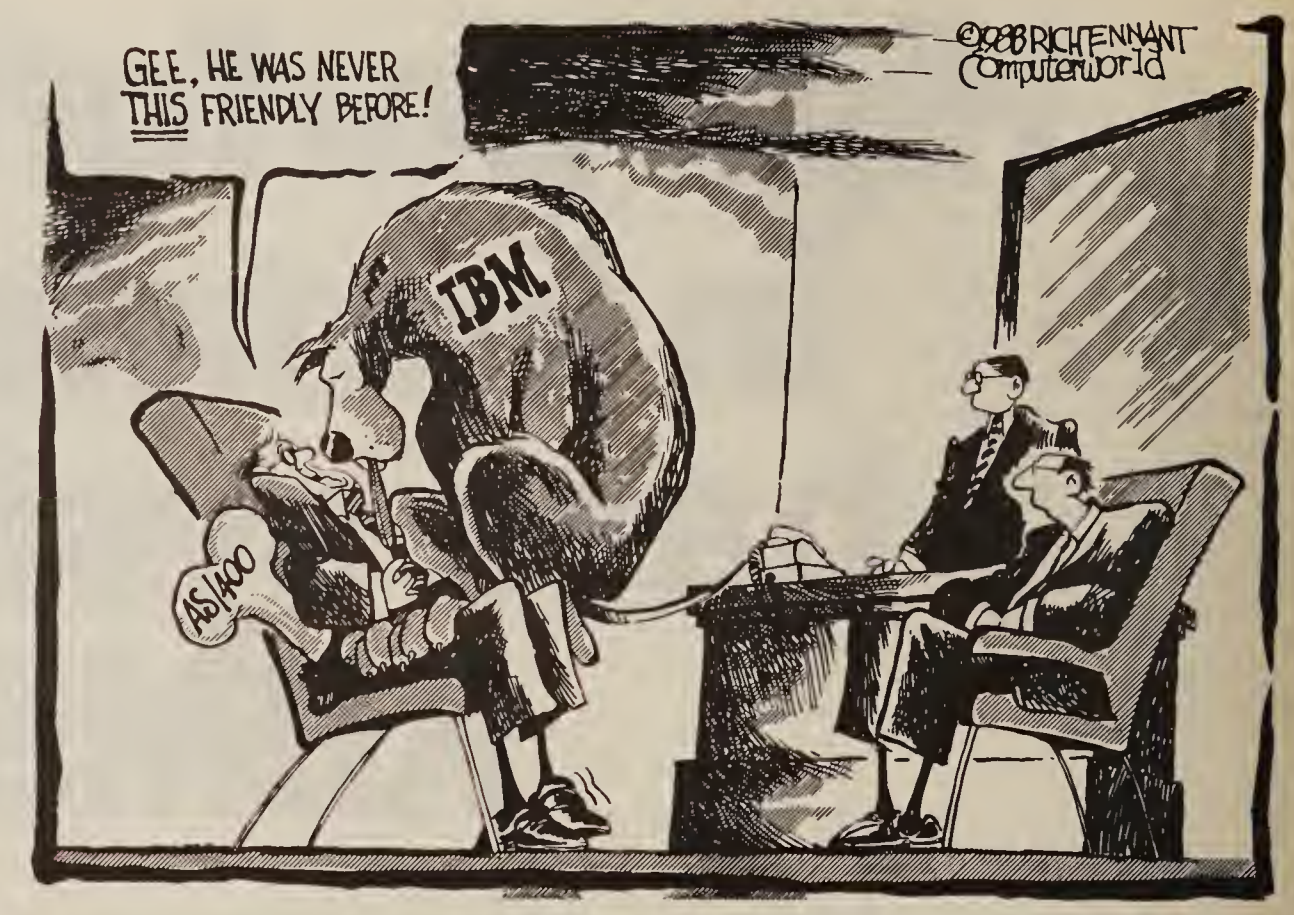
Also, the study findings hint that CEOs are apt to view IS more positively as a whole in those companies in which the perception of IS held by the end users is also positive.

Taken in sum, the findings of this study are very positive for systems management, and they reflect the fact that a progressive firm's computer-based information investments are being looked upon increasingly as a strategic cog in the corporate competitive arsenal and less as a pure cost center.

However, it is unsettling that only one in 10 executives polled claim to be able to adequately assess the business value of technology investments. The reason may well lie in another of the study's findings: A majority of executives polled felt the skill most lacking in their staff members was an understanding of the corporation's business. Meanwhile, three of four respondents claimed the most vital qualification for senior information managers was general management skills, not technical skills.

These findings mirror the results of *Computerworld*'s research last year into the state of MIS education at U.S. universities. That study determined that the greatest deficiency in MIS education was not technical training but basic business acumen.

It just may be that information department budgets are enjoying something of a honeymoon with top management at present, as CEOs buy into the concept of the strategic and competitive advantage of IS. But it is likely that that won't last in the event of an economic downturn, which may come within a year or so. It is time to shake the lead out and pay more attention to business.



LETTERS TO THE EDITOR

The overlooked

In response to the article on the organizational chart of the MIS world [CW, Oct. 31], I once again find the age-old stereotype that secretaries do nothing and have plenty of time on their hands. Yes, the programmers do have word processing, but do they use it? For the most part, no!

Word processing duties are still the secretary's responsibility. Word processing allows us to handle heavier workloads at a faster pace. As far as time is concerned, eight hours is still not enough time to complete our many tasks. Regardless of new technology, I doubt that we will ever have time to sit back and control the "basic employee needs." Try removing secretaries from the organizational chart, and see if there is an organization left.

Deirdre S. Jackson
Atlanta

The established

Your article "Shortcutting net guesswork" [CW, Oct. 17] was a witches brew of strange premises that offered a concoction of mysterious conclusions.

Following the introductory topics, two very questionable premises emerge. The first suggests that newer, unproven tools have somehow conquered the data collection problems and offer a breakthrough to network designers. We are treated to a "comparison" between an established tool (Connections) and newer tools in an attempt to "prove" the point. The second premise is that these new tools in their infant stage represent the new breed. Let me assure you and your readers that these premises are false.

I don't object to the article using Connections products as a reference point to compare with other network design products. I do expect that when you choose to mention how new tools partly address the data entry problem, you also give an indication of how completely they address the problem. We are not given the relative value of these features in the scope of things. It is a cheap shot at Connections to take one comment and suggest that it is representative of our products without mentioning the many ways we help our customers in the area of data collection.

The point is that these recent tools are, in many ways, no more automated than ours for the simple reason that the data collection problem is largely a problem with the measurement and collection infrastructure, not with any deficiency in our products.

Thomas E. Krpata
Director, Consulting and Education Services
Connections Telecommunications, Inc.
Brockton, Mass.

The differences

Harvey Newquist [CW, Oct. 17] is absolutely correct in his depiction of the artificial intelligence culture. Prolog should not be thrown into the same pot as LISP just because they both have some facilities for symbolic processing.

First, Prolog is a relative newcomer compared with LISP, which has been redefining and recompiling itself since the days of Fortran. Second, Prolog is not invisible in the mass market today. A highly efficient and well-marketed dialect, Borland International's Turbo Prolog, is catching on and seeding interest.

Third, there are many new grass-roots uses of the language, including very large-scale integration design verification, scheduling, message parsing, constraint logic programming with applications to options trading and Cobol recoding applications in which the language is proving itself far from "exhausted." The only things that may be slightly exhausted are the leading Prolog vendors, who are struggling to produce ever more efficient compiled code on a wide variety of platforms and are three to five years behind the technical capabilities of the language.

Benjamin Cohen
President
Logic Works, Inc.
New Brunswick, N. J.

The reality

A recent article, "HP facelift leaves blemishes" [CW, Aug. 8], had an error in reference to our database offering.

The first bullet point incorrectly stated that we lack a relational database on HP 3000 Series 900 business computers. A true relational database, HP SQL, has been available on the Series 900 since August 1987 and is installed at numerous customer sites.

Susan Bockus
Product Marketing Manager
Computer Systems Group
Hewlett-Packard Co.
Cupertino, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

A plea for practical innovation

JIM MANZI

I recently saw some pictures taken at the launch of the space shuttle *Discovery*, and they reminded me of the excitement I felt as a teenager when I saw the first man walk on the moon.

But now, the thrill of the space program is gone. The *Discovery* is just a piece of hardware, not a goal. We haven't developed a rationale for manned space flight that gives us a clear vision of where we are going and why. Yet manned space flight still has the potential to galvanize the nation.

I see parallels in the computing industry. The industry is facing as exciting a frontier as the space program. Computing had as radical a beginning, promising to remake the way people thought, the way they related to information.

We did all that. What we have accomplished is as important in its own way as putting a man on the moon. We find ourselves in a position similar to that of the space program. We talk to our customers about hardware and software, not about where we are going, how we propose to get there and why they should come along.

There has never been a more critical time to reassess, redefine and reaffirm what we are trying to accomplish as an industry. Observers are beginning to forecast a recession for the computer industry in 1989. Such prophesies can be self-fulfilling. If our customers see headlines about a slump in personal computer sales, it moves them to reexamine their budget premises.

Manzi is the chairman, president and chief executive officer of Lotus Development Corp. in Cambridge, Mass.

Binge/bust mentality

Our industry has a binge/bust mentality that reflects a division between pragmatists and visionaries, between those selling boxes and those selling dreams. In fact, we are selling neither. We need to have a better idea of where we are going and how to get there. In other words, we need a strategy, one that will help us ward off a recession.

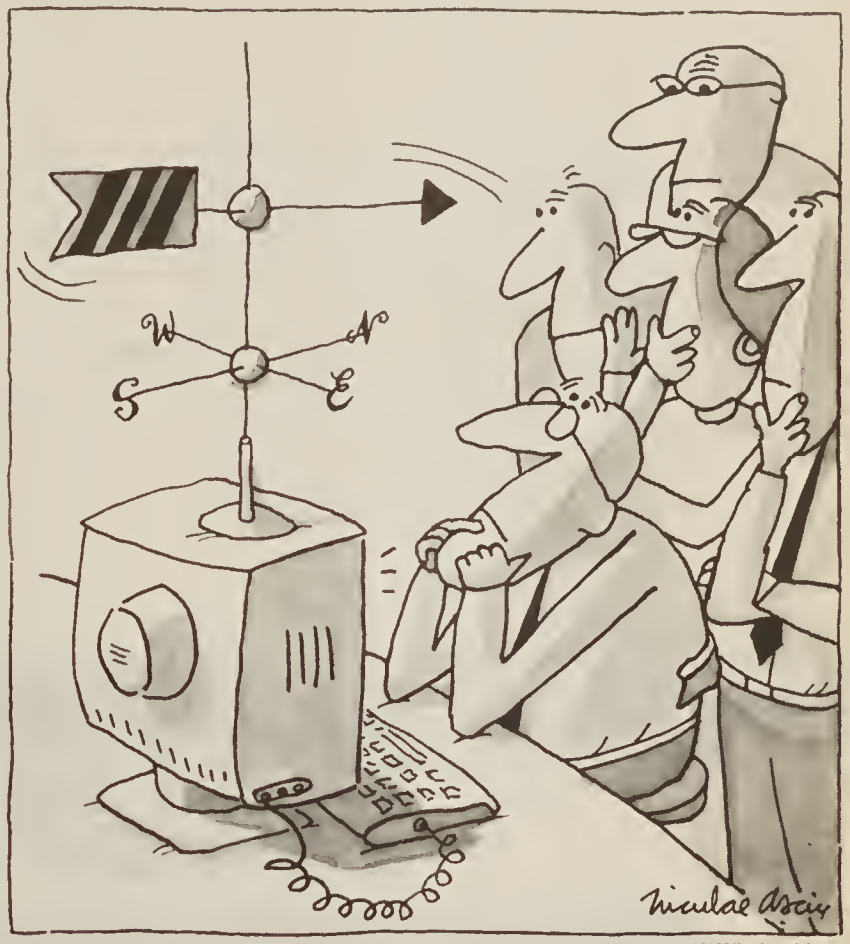
We seem to have become the desktop equivalent of a new car dealer, convincing our customers that only the latest and greatest products have value. Is that what we really think software is all about? Is that what we intend to be selling?

Appropriate software use may bring about the advances in white-collar productivity this country so badly needs in order to compete in the global marketplace. Yet the message we send to our customers is that the discounted $299 price tag is their investment, not the customized applications they have built on top of our platforms. We pay lip service to the systems approach, while continuing to push boxes of products in a piecemeal way.

We seem to have two de facto strategies: On the one hand, we stress point products and newness; on the other, we extol systems integration, usability and stability. We need to combine the two. Yes, it is critical to offer our customers cutting-edge technology. But it is also of paramount importance to preserve our customers' investment in data and to provide applications consistency across platforms, end-user training and service and support.

The market is clearly evolving into multiplatforms and multigeneration hardware. We will need to focus on such issues as extreme portability, variety of user interfaces and coexisting operating systems.

The task won't be easy. If a system is to be transportable across a number of platforms, applications will have to be rewritten. And because different computer architectures read in different ways, both the portable program and the data must be translated for them.



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The difficulties are compounded because features such as memory management, error handling and display processing are handled differently under different operating systems. Even the bugs need to be preserved as existing programs are rewritten, because someone, somewhere,

Continued on page 25

He tested the claims of design-first authors

READER'S PLATFORM

GOPAL KAPUR

My first reaction to a cursory reading of "Form precedes function" by Fred Forman and Milton Hess [CW, Sept. 5] was that it was unbelievable. I thought I must have misunderstood, so I read it again, carefully underlining each incredible statement.

Early in the article, the authors state, "By developing the specifications from a purely functional perspective, the design team . . . has exposed the project to three problems."

Under the heading "Intellectual complexity," the authors said, "If the specifications are too complex for the chief architect to maintain in his head . . . ."

Since when is the chief architect of any project supposed to maintain specifications in his head? Can you imagine a skyscraper or a large aircraft project of which the chief designer never translates the design concepts and detailed specifications into documentation? How can complexity of specifications justify not writing things down?

The authors continue, "Total understanding of the project is dispersed among all the members of the project team."

Since when is the need for each member of the team to understand the total project a stumbling block to project success? Any group of people, if they are to be referred to as a team, must have an absolutely clear and complete understanding not only of their individual parts of the project but also of the bigger picture.

Kapur is president of the Center for Project Management in San Ramon, Calif.

Motley crew

Imagine a symphony in which the individual musicians are kept ignorant of the main score and know only their individual parts — one in which the conductor commits the entire score to memory and nothing at all is written down.

In the paragraph titled "Technical risk," the authors state, "Functional decomposition limits the opportunity for the project team to consider alternative design early in the project."

If what the authors conclude is true, it is not functional decomposition that is to be blamed. The real culprit is functional ineptness of the team, along with functional (mental) decomposition of their project manager.

Under the heading "Standards enforcement," the authors claim, "It is difficult to achieve uniform specifications, design and development practice on a large project."

The main reasons behind that difficulty are a total lack of standards, procedures and guidelines, the unbelievable lack of quality assurance and complete absence of inspections in most MIS and data processing projects. Imagine an aerospace project in which the design drawings are not drawn to scale, symbols are nonstandard and measurements not documented.

Bigger than a breadbox

After reading the article, I decided to test the claim that "an architect designs an office building around a generic set of requirements." I strolled over to an architect's office to discuss the design of a new office building.

Keeping the words of the authors in mind, I described to him my needs as follows: something not too large but not too small; not too expensive but certainly not cheap; having a certain physical presence but not obtrusive; and to be occupied by a small number of large companies and a large number of small companies.

The architect shook his head and with a slight agitation in his voice said, "Could you be a bit more specific? What you are saying makes no sense."

No woodpeckers allowed

I read to him what the authors had written, "An architect designs an office building around a generic set of requirements tied to a site's characteristics and to the type of tenants to be served."

He reached into his desk drawer and brought out a sign that read, "If architects designed and built buildings like data processors design and build systems, the first woodpecker to come along would destroy civilization."

Then, not so politely, he showed me the door.

Under the paragraph headed "Technical risk," the authors state, "The project team is composed of people who have their own ideas of how the system should work. The project team can unwittingly embed these ideas in the specifications . . . ." The problem has nothing to do with being unwitted; the real problem lies with being dim-witted. Most of this problem can be attributed to the fact that education and training lags far behind the introduction and use of technology.

A recent report by Case Research states, "All too many continue to underestimate the need for training. Some 70% of respondents said that less than 25% of their programming staff had been trained on CASE tools."

During the last few years, I have been continually confounded by the growing problems of perpetual traffic jams, inordinate delays at airports and the failure of a large number of software projects. Then I came across the authors' assertion, "Other examples of the design-first approach include the construction of commercial aircraft, highways and computers." At last, I understand.

Under the paragraph titled "Keep it simple," the authors said, "The objective of the design-first strategy is to replace the complex structure of interactive subsystems with linear arrays of standard types of components embedded in a foundation software framework."

My objection here is that the authors label these well-known, long-espoused (unfortunately, seldom implemented) good design practices as their design-first approach. The fact is that T. Capers Jones, along with a number of others, has been trying to educate the profession for close to a decade on just these practices.

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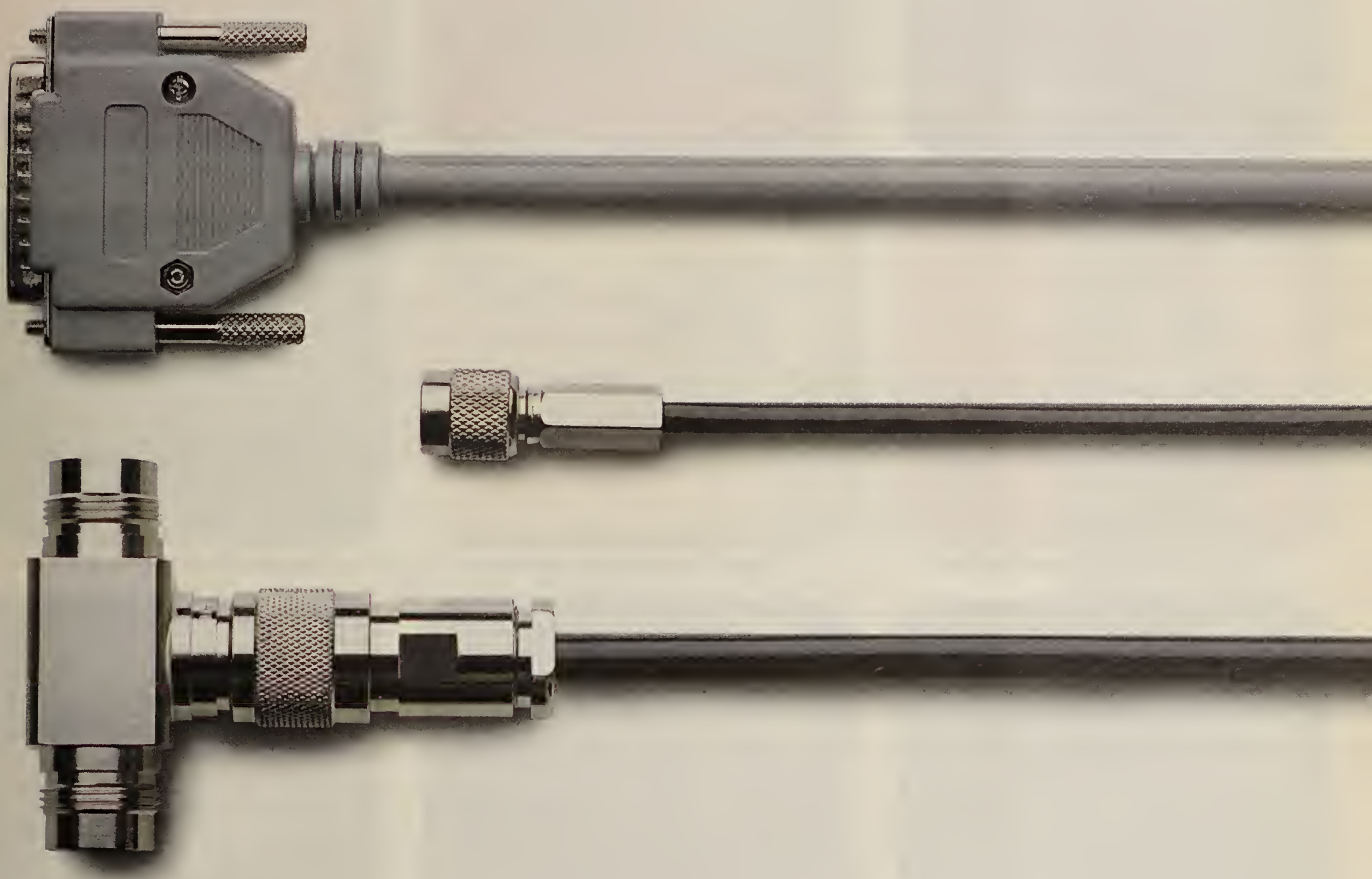

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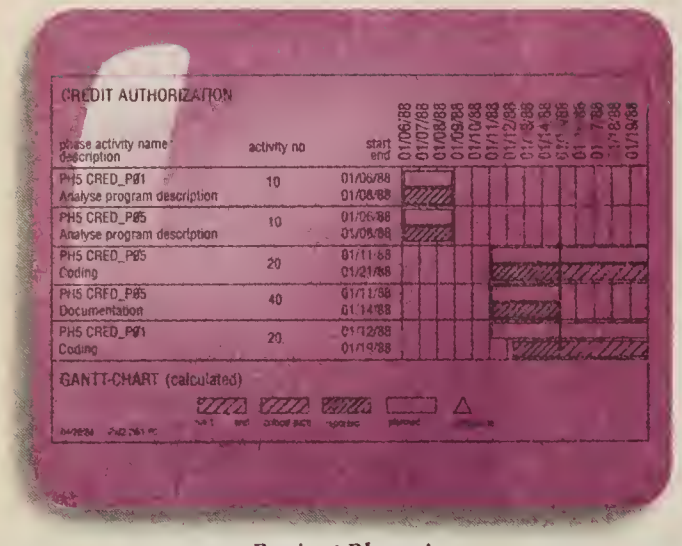
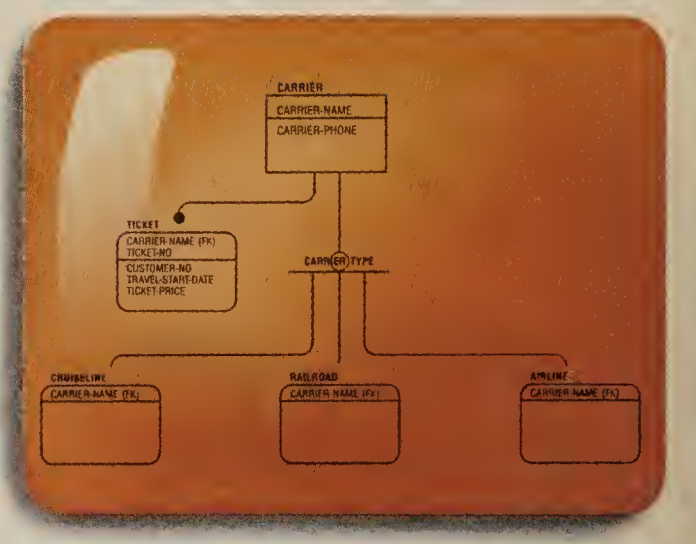
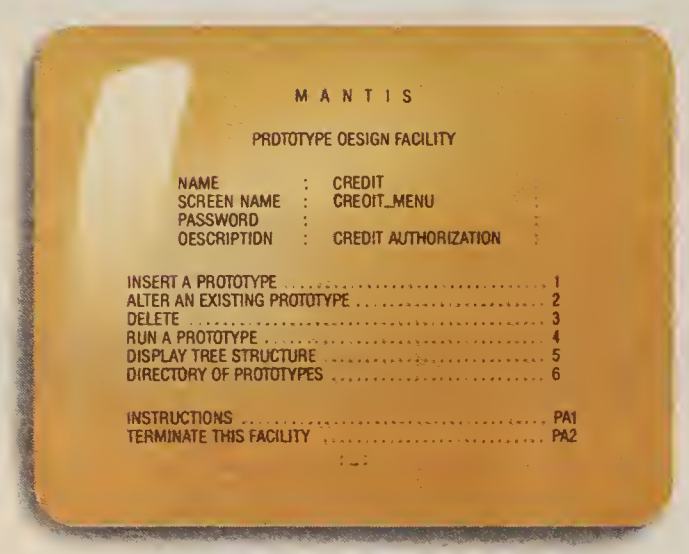


Project Planning

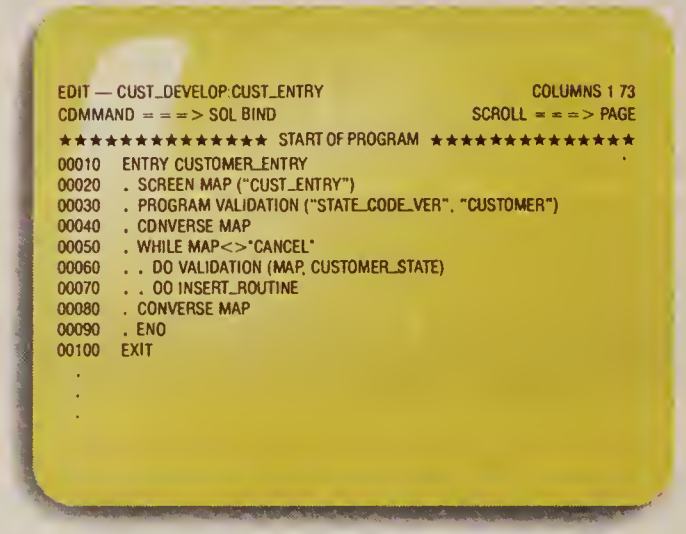
Interactive Design Features



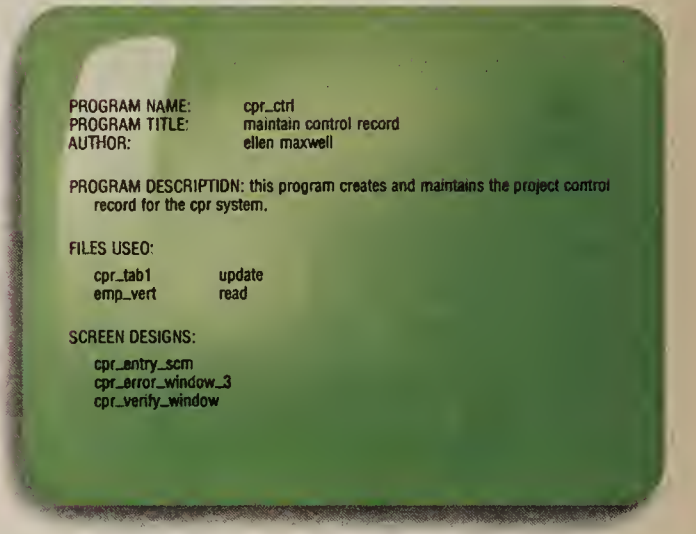
Graphic Design Features



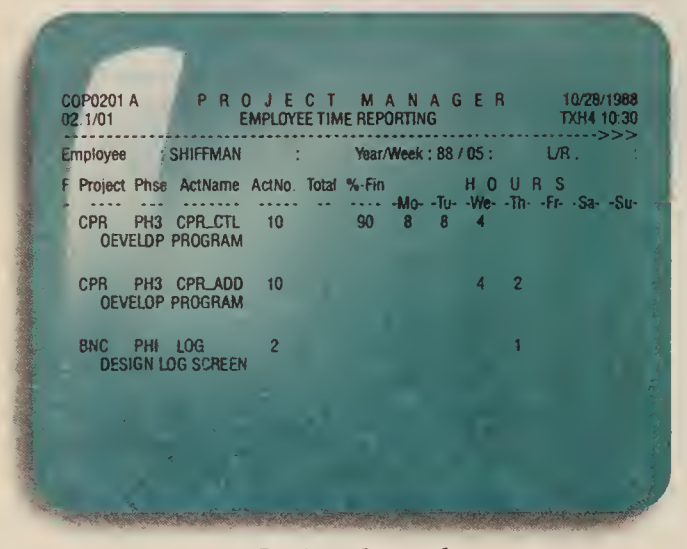
Prototyping & Specification Refinement



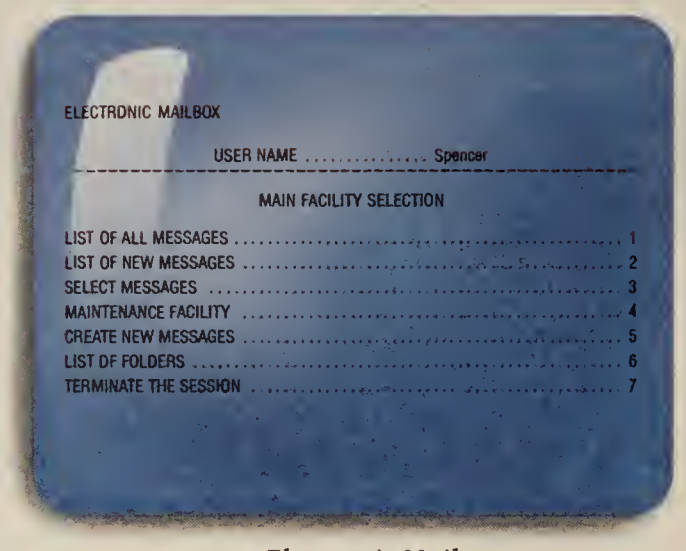
Advanced Development Languages



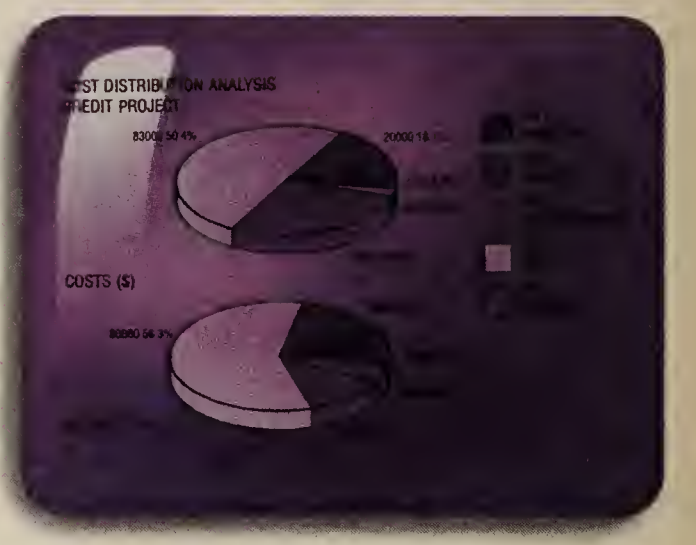
Interactive Documentation Management



Project Control



Electronic Mail



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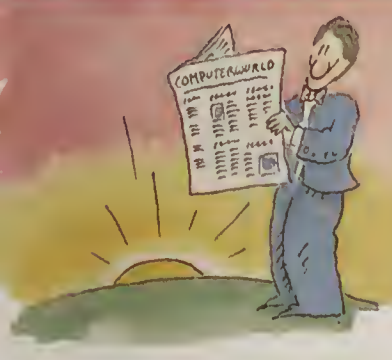

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Manzi

CONTINUED FROM PAGE 23

has capitalized on that bug and has come to depend on it.

If we can complete these tasks successfully, it will represent a fundamental transition in the history of computing.

Our customers are leading the way in this transition. They are making the shift in how they deploy computing from tactical to strategic tools. By some estimates, there will be one PC for every three white-collar employees by 1990. Within the next decade, the number of PCs is expected to quadruple to 46 million. Those 46 million PCs do not want to free-float. They crave connectivity.

Yet the industry has barely begun to scratch the surface of potential group applications. We understand the potential of computers only to a limited extent. And most of us in the computing community understand even less about how the majority of businesses function. This is because we work on cutting-edge products in cutting-edge organizations with few middle management layers.

We can't prescribe productivity solutions for more traditional businesses until we know more about their needs. That is our frontier for the 1990s. Sometimes I feel as if our industry is 150 miles off in space, looking down at the workaday reality.

Our job is not to dream up a host of new features but to look for what needs to be done. What our customers need from us is the stability, usability and utility on which they can leverage their computing, training and applications investment. Our software must directly address our customers' problems in a highly competitive business environment by delivering such intangibles as better quality, greater flexibility, faster time to market, higher customer satisfaction and more.

For newness' sake

Genuine innovation should be defined as effectiveness, problem-solving ability, ease of use and applicability. We don't need newness for the sake of newness, or novelties that please less than they impress. We need to pay more attention to the computing industry analog for what Black & Decker learned in its industry: Its customers didn't want quarter-inch drills; they wanted quarter-inch holes.

This isn't to say that new technologies and new software products aren't needed. What I am saying is that we need to find that elusive hybrid between what is needed and what is possible — something that builds logically on the base of past development.

A balance is essential: between innovation and utility, cutting edge and practicality, product expansion and systems standards, the short-term tactical view and the long-term strategic one.

To America at large, we must offer software tools to improve our country's pattern of decision making and the way we determine priorities and set goals. These tools can help build the stature of our technology, help probe our economic policies and commitments and put the results to work quickly and effectively. And we must do our best to ensure that we maintain our world preeminence in software technology.

BOOKS IN BRIEF

Modern Structured Analysis
By Edward Yourdon
The master of methodologies takes beginners as well as veterans deep into the formal structures of systems analysis.
Hardcover, 672 pages, $34, ISBN 0-13-598624-9, by Yourdon Press, Prentice Hall, Englewood Cliffs, N.J.

The IBM PC & PS/2
By Peter Norton and Richard Wilton
This "programmer's guide" adds the Personal System/2 line to the well-known reference on IBM Personal Computers.
Paperback, 528 pages, $22.95, ISBN 1-55615-131-4, by Microsoft Press, Redmond, Wash.

Introduction to the X Window System
By Oliver Jones
Inside X Windows, the software environment for engineering workstations developed out of MIT's Project Athena.
Paperback, 511 pages, $32, ISBN 0-13-499997-5, by Prentice Hall, Englewood Cliffs, N.J.

Cognizers: Neural Networks and Machines That Think
By R. Colin Johnson and Chappell Brown
A clearly presented, readable look at neural networks, hyped a bit prematurely here as "revolutionizing business, industry and science."
Hardcover, 260 pages, $22.95, ISBN 0471-61161-1, by John Wiley & Sons, New York.

Life with Unix
By Don Libes and Sandy Ressler
Billed as an "irreverent" guide for everyone who has not yet mastered the Unix operating system but wants to.
Paperback, 346 pages, $29.95, ISBN 0-13-536657-7, by Prentice Hall, Englewood Cliffs, N.J.

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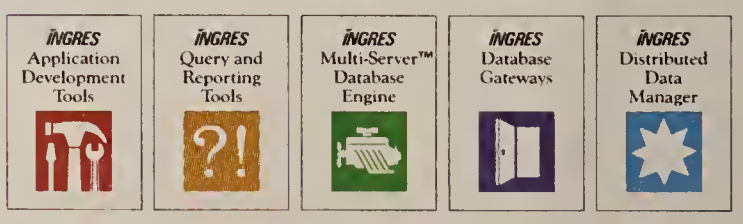

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HARD TALK

Rosemary Hamilton

Variable rate service?

Recently, an IBM System/36 user from New York called to tell me a story about IBM. It seems he was trying to get information about Mapics II, IBM's manufacturing software, and he came up against a very uncooperative IBMer who wouldn't give him product information and refused to provide names of other Mapics II users as references.

This call came while I was putting together a story about a bunch of satisfied System/36 users. This group was moving to the new IBM mid-range platform, the Application System/400, and they recounted tales of the great job IBM was doing for them.

The New York user's situation may have been an isolated incident. Maybe that IBM representative was having a bad day.

But, when compared with the stories told by new AS/400 users, the New Yorker's story can indicate something else. It could be more proof that when IBM has a compelling reason to roll out a red carpet for users, it can do so like few other vendors. And when there is no compel-

Continued on page 39

HP latest to research superconductor benefit

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. is the latest of several firms to commit itself to research toward the development of superconductors for use in computers.

Despite their promise of greater speed, superconductors are still many years from appearing in commercially useful machines, HP officials said.

HP joins the ranks of IBM, General Electric Co., TRW Corp., Westinghouse Corp. and other firms in the race to make superconductor technology available. In late October, HP bought into Conductus, Inc., a group of former Stanford University researchers dedicated to superconductivity.

Simultaneously, HP is developing its own superconductivity lab to address both computer and measurement instrument applications. John Moll, associate director of the lab, said that he expects a future machine to be a marriage between superconductor and semiconductor technology.

Less power needed

"Ultimately, the superconductor could affect computational speed and power," said the lab's director, Len Cutler.

Compared with CMOS or emitter-coupled logic technol-

Continued on page 39

CA unveils VAX-based Supercalc

BY AMY CORTESE
CW STAFF

In pursuit of its goal to become a one-stop shop for multivendor users, Computer Associates, Inc. continues to roll out products for the Digital Equipment Corp. VAX market. The recent announcement of the Supercalc spreadsheet for the VAX brings the number of CA VAX products to more than 20.

Supercalc will be available for the VAX/VMS environment in the second quarter of 1989, according to the company. The VAX-based Supercalc product is a rewritten version of CA's mainframe spreadsheet package. CA has had success with its mainframe Supercalc: With nearly 400 customers, Supercalc is the leading mainframe spreadsheet. Mark Wasilko, senior vice-president of marketing at CA, believes an even greater opportunity exists in the VAX market.

However, CA will be up against some tough competition with its new product. Access Technology, Inc.'s 20/20

Continued on page 37

VSE users upbeat

IBM changes attitude, position on migration

BY STANLEY GIBSON
CW STAFF

After putting up with a bitter aftertaste for several years, users of IBM's VSE operating system are starting to smile once again.

No longer is IBM trying to move them en masse to the promised land of MVS. For now, VSE users are getting some of the functionality they have long coveted. They believe that IBM will offer them more without a costly and difficult migration.

"VSE has been resurrected again. It's like a phoenix rising out of the ashes — for the fourth or fifth time," said Bill Dodge, a senior systems programmer at the National Wildlife Federation in Vienna, Va. "I wasn't always the optimist I am now. IBM stopped responding for a while," he added.

"Today, we have backed off from saying that all VSE users have to migrate," said IBM's senior product administrator for VSE marketing in an interview with *Computerworld*. The manager asked that his name be withheld from publication.

Not only is IBM easing off its hard-line position on migration, but it is turning its attention anew to VSE development.

"VSE is here to stay. . . . We

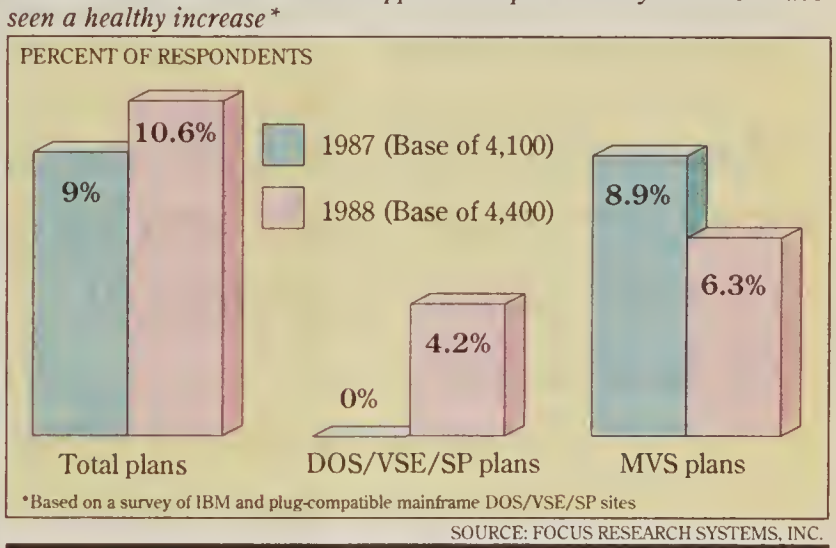
Continued on page 37

Inside

- IBM Application Systems Division, Part 2. Page 33.
- University of Lowell boasts first graphics supercomputer. Page 33.
- Prime Factors touts data encryption tool. Page 42.

No dampened enthusiasm for DOS/VSE/SP

*Plans to convert to MVS have dropped while plans to stay with VSE have seen a healthy increase**



*Based on a survey of IBM and plug-compatible mainframe DOS/VSE/SP sites

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ProEdit lets you create and load test tables and indexes much faster, because it presents each row of a DB2 table as a line in an ISPF session. So you can eliminate SQL coding and use the quick ISPF commands you already know to edit DB2 and SQL/DS tables.

With ProEdit, you'll quickly and easily modify existing tables to create new ones, copy data into a new table, modify multiple rows at once, create DB2 indexes, unload DB2 tables to a data set, and much more.

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What's more, ProEdit lets you test embedded SQL while you are editing your COBOL or PL/1 source code. There's no need to extract the SQL, substitute literals for host variables, and then invoke SPUFI. No need to use SPUFI at all, in fact, since ProEdit does everything SPUFI does—but much faster and without leaving the ISPF editor.

■ TOOLSET®-DB2. Simplify the Maintenance of DB2 Objects, Their Data, and Related Security.

This valuable set of DB2 productivity tools includes SQL Source Generator, which automatically generates all SQL CREATE and GRANT statements from existing DB2 Catalog entries—both for a single object and for an object and all its dependents. It also helps you to understand DB2 object relationships, because it presents a hierarchy of objects on your screen.

Another tool, Data Dumper, takes data from DB2 tables or views and converts it to sequential file format, eliminating the need for extra programming—as well as the need to know how to program in order to accomplish this task. And Security Cloner lets you automatically replicate or remove user security, saving you countless hours of writing SQL GRANT/REVOKE statements for new or departing users.

■ ProBuild™. Build DB2 Application Prototypes and Tools in Half the Time.

The ease and convenience of using CLIST is now available to those working with DB2. ProBuild lets you embed SQL commands within a standard CLIST—making routine tasks much easier by eliminating the effort of writing COBOL or PL/1 programs to accomplish them.

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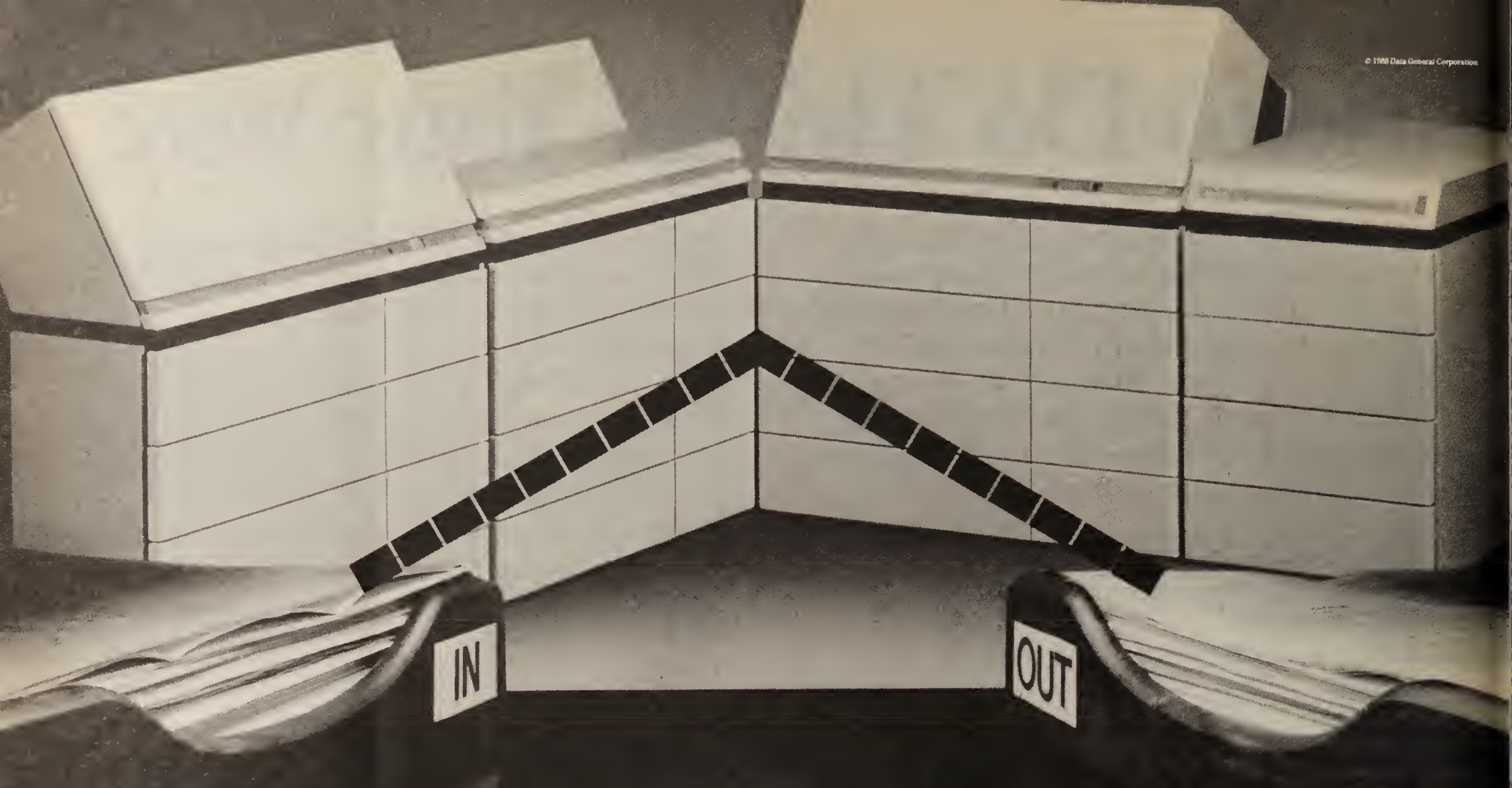

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SOFT TALK

Stanley Gibson

Playing with a full DEC

All right, which software company hasn't announced an agreement with DEC? There must be one somewhere, but who?

Oracle, Computer Associates, Ashton-Tate, Lotus last week and Cullinet this week. Products are few and far between, but the intentions are flying fast and furious. Is it all a lot of noise or is there something more there?

Whoa! Let's not jump the gun looking for products. Noise is important. It sends out a message that DEC is not going to be surpassed in software or connectivity. What is out there will run on, or connect with, DEC equipment. That in itself is a valuable message for DEC to communicate.

This message, I believe, is in response to IBM's emphasis on software as embodied in its Application Systems Division (ASD) (see story this page). DEC, through its agreements, and IBM, through the ASD, are seeking to encourage the development of new packages and the porting of existing software to their platforms.

The premise of this effort is fairly simple for both firms: Whomever has the most software will sell the most hardware.

Continued on page 39

IBM's Guglielmi on the nuts and bolts of the ASD

IN PERSON

Second in a two-part series

Last week, Joseph Guglielmi, an IBM vice-president in charge of the Application Systems Division (ASD), talked of the changing role of the ASD in IBM's overall software strategy. Here, Guglielmi discusses the nuts and bolts of the division with *Computerworld* Senior Editor Rosemary Hamilton. He discusses product rollouts and vendor alliances, including IBM's controversial deal with Hogan Systems, Inc. in Dallas.

How many applications products have been shipped in the last year as a direct result of the ASD's efforts — both IBM-developed and those shipped by third parties in conjunction with IBM?

We have in our portfolio today — that includes applications for the PC up to the 3090 — over 1,000 products. In 1988, we either enhanced or provided new products in the area of about 400.

The most visible would be the AS/400. When we announced it, we also announced that ASD would provide 70 applications for the AS/400. We announced they would be shipped through the fourth quarter of this year and the first quarter of next year.

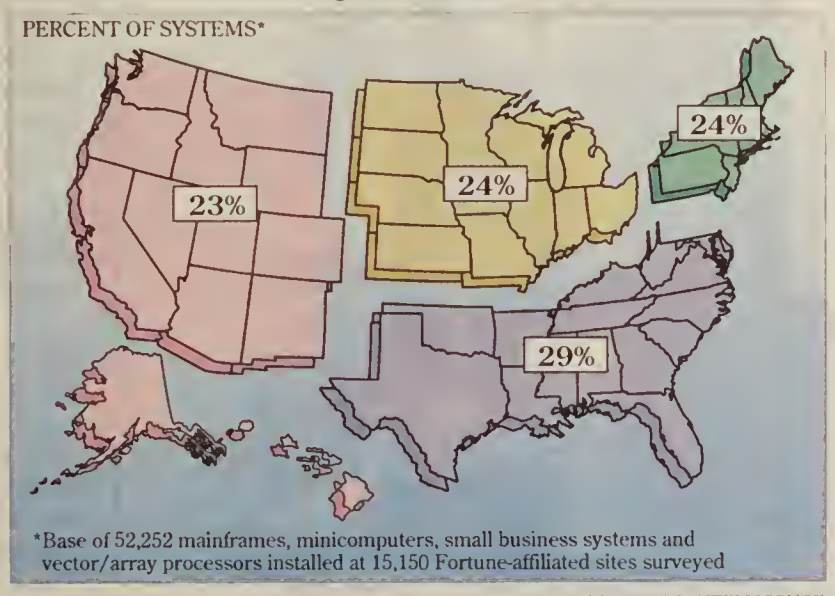
At the same time, we announced that almost 1,000 of our business partners had applications that would run on the AS/400. ASD was the major driver in getting the software

Continued on page 40

Data View

The geography of computing

Installed systems at Fortune 1,000 sites are fairly evenly distributed by region nationwide



*Base of 52,252 mainframes, minicomputers, small business systems and vector/array processors installed at 15,150 Fortune-affiliated sites surveyed

SOURCE: COMPUTER INTELLIGENCE

Supertrio on campus

University enlists graphical power of Stellar

ON SITE

BY JAMES DALY
CW STAFF

LOWELL, Mass. — In the midst of the city that spawned the U.S. industrial revolution more than 150 years ago, another reshaping of existing technological standards has begun.

A trio of Stellar Computer, Inc.'s Graphics Supercomputer GS1000s at the University of Lowell are streamlining the task of computer-aided chemistry and computer-aided design in a way only dreamed about at the beginning of this decade.

In March, Newton, Mass.-based Stellar shipped the industry's first graphics supercomputer. The system coupled minisupercomputer performance levels with sophisticated three-dimensional graphics capabilities.

The desktop GS1000 was designed for engineers in need of high performance for both graphics and computations, and the university has given the machine a run for its money in both areas.

The GS1000, which was introduced at a time that saw similar graphics supercomputers announced by Ardent Computer Corp. and Apollo Computer, Inc., provides the school with the computational muscle to carve through compute-intensive applications.

"We've increased our computation speed nearly 30 times," said Tom Costello, a school vice-president in charge of technology acquisition and planning. Costello added that the machines often perform 40 million floating-point operations per second at peak performance.

But besides the computational punch, Costello sees the machines as the way of the future for science labs.

MARTHA EVERSON

Costello *with display powered by Stellar*

"As an educational institution, we look on these machines as an investment in where computer graphics are going," he said.

One place computer graphics are currently going is the field of molecular modeling, in which the machines are used as scratch pads to vicariously break down and reshape substances at their molecular level to create new compounds.

Currently, research is being done on creating a thin-film material for storage disks. "We need to design a molecule that essentially looks like it has a hook on one end so that it not only sticks to the tape but has all the electromechanical proper-

Continued on page 34

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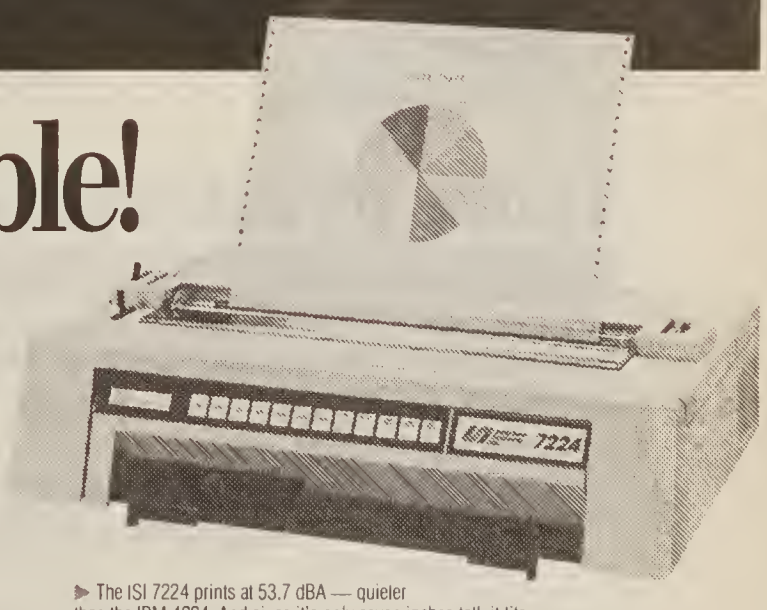

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HARD BITS

Image Business Systems nabs $1.8M contract

New York-based **Image Business Systems Corp.** celebrated the appointment of David Sarna as president by announcing that the Texas State Board of Insurance has awarded it a $1.8 million contract to install its Imagesystem integrated document image processing system.

Tired of your old **Intecolor Corp.** terminal or monitor? Then trade it in. The Atlanta-based company has announced that it will allow customers to trade in used terminals or monitors in exchange for discounts on newly purchased models. Savings of up to 30% can be had in exchange for trading in working or nonworking F8000, 3800, 8800 or AG series terminals and its Megatrend line of monitors, the company said.

Visual Technology, Inc. has signed a $2 million OEM distribution agreement with Japanese computer vendor **Kubota Ltd.** under which Kubota will offer Visual's 640 X Window display station to the Japanese and Pacific Rim markets.

Princeton Graphic Systems has announced the implementation of a new warranty on its line of IBM Video Graphics Array monitors that provides five-year coverage on parts and two-year protection on labor. It will cover all monitors and shipping, and it will be extended retroactively to all VGA monitors already purchased, the Princeton, N.J., firm said.

Convex Computer Corp. has entered a joint marketing agreement with **Tektronix, Inc.** through which Convex C series supercomputers and Tektronix 4300 and 4200 series high-resolution graphics workstations and netstations will be offered as integrated graphics packages.

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HP announces latest 9000 workstation

FORT COLLINS, Colo. — Hewlett-Packard Co. late last month pressed the engineering workstation envelope at the low end with the debut of the HP 9000 Model 340, which packs the power of Motorola, Inc.'s 68030 technology into a $5,495 machine with 4 million instructions per second performance, the firm said.

The Model 340, which began shipping last week, establishes a new entry-level product for the 68030-based HP line, which started with the introduction of the Models 360 and 370 earlier this year, said Bill Kay, general manager of HP's workstation group. The system uses a relatively inexpensive chip set running at 16.6 MHz and has only one optional expansion slot.

It supports a broad spectrum of graphics choices (two monochrome and three color configurations), has up to 16M bytes of random-access memory and an optional accessory slot and is object-code compatible across HP's Series 300 line, which runs on HP-UX, the firm's flavor of Unix. Such compatibility, Kay said, makes an estimated 750 advanced software applications immediately available on the Model 340.

The Model 340 is available in five configurations at prices ranging from $5,495 to $15,995.

Supertrio

CONTINUED FROM PAGE 33

ties that you need to record the information and recover it," Costello said.

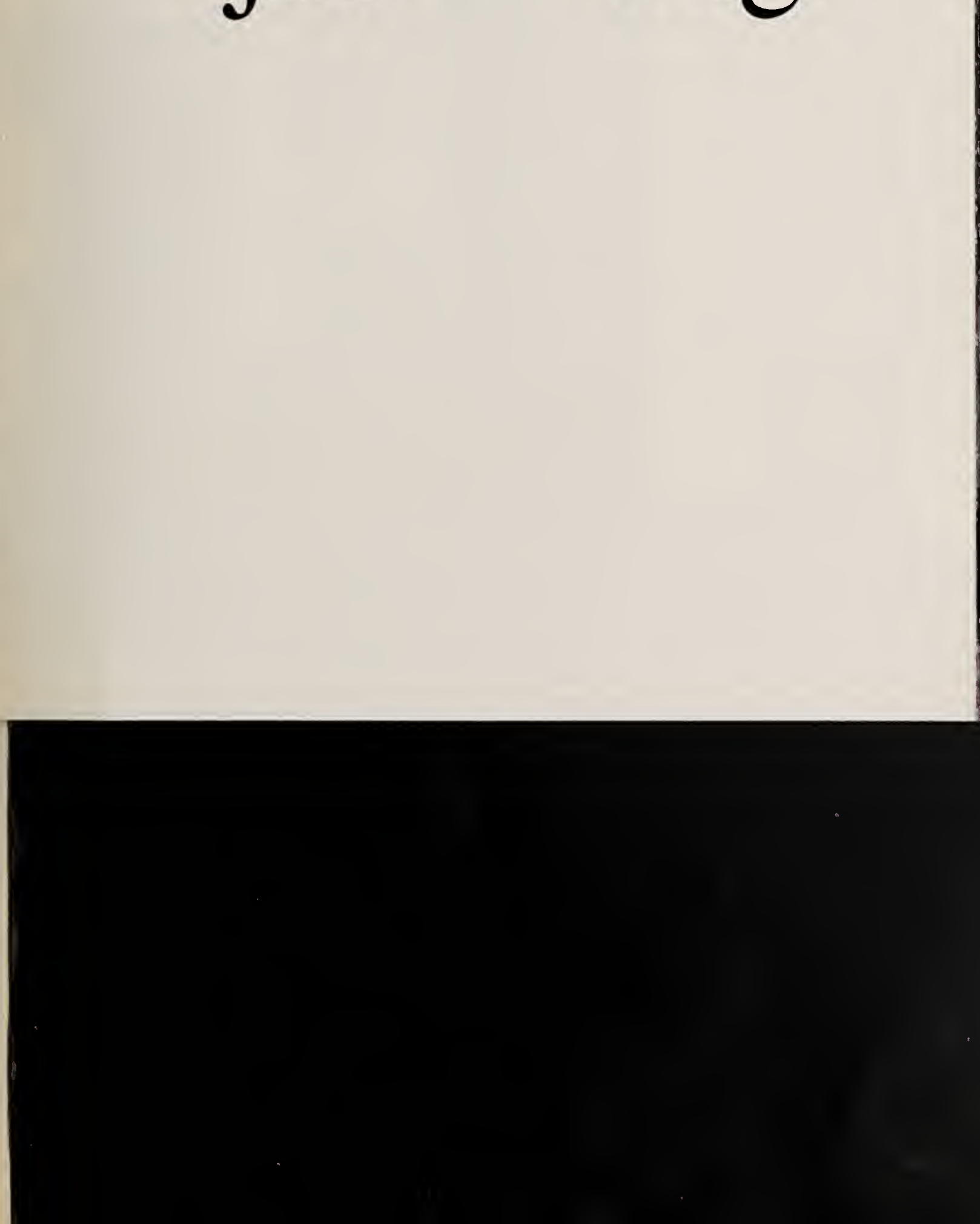
In addition to the main computing engine, the Stellar workstation includes an Intel Corp. 80386-based subsystem connected to the main processor by an IBM Personal Computer AT-compatible bus. The monitor's ability to form a 1,280- by 1,024-pixel resolution picture also allows researchers attacking such problems to form sophisticated screen images.

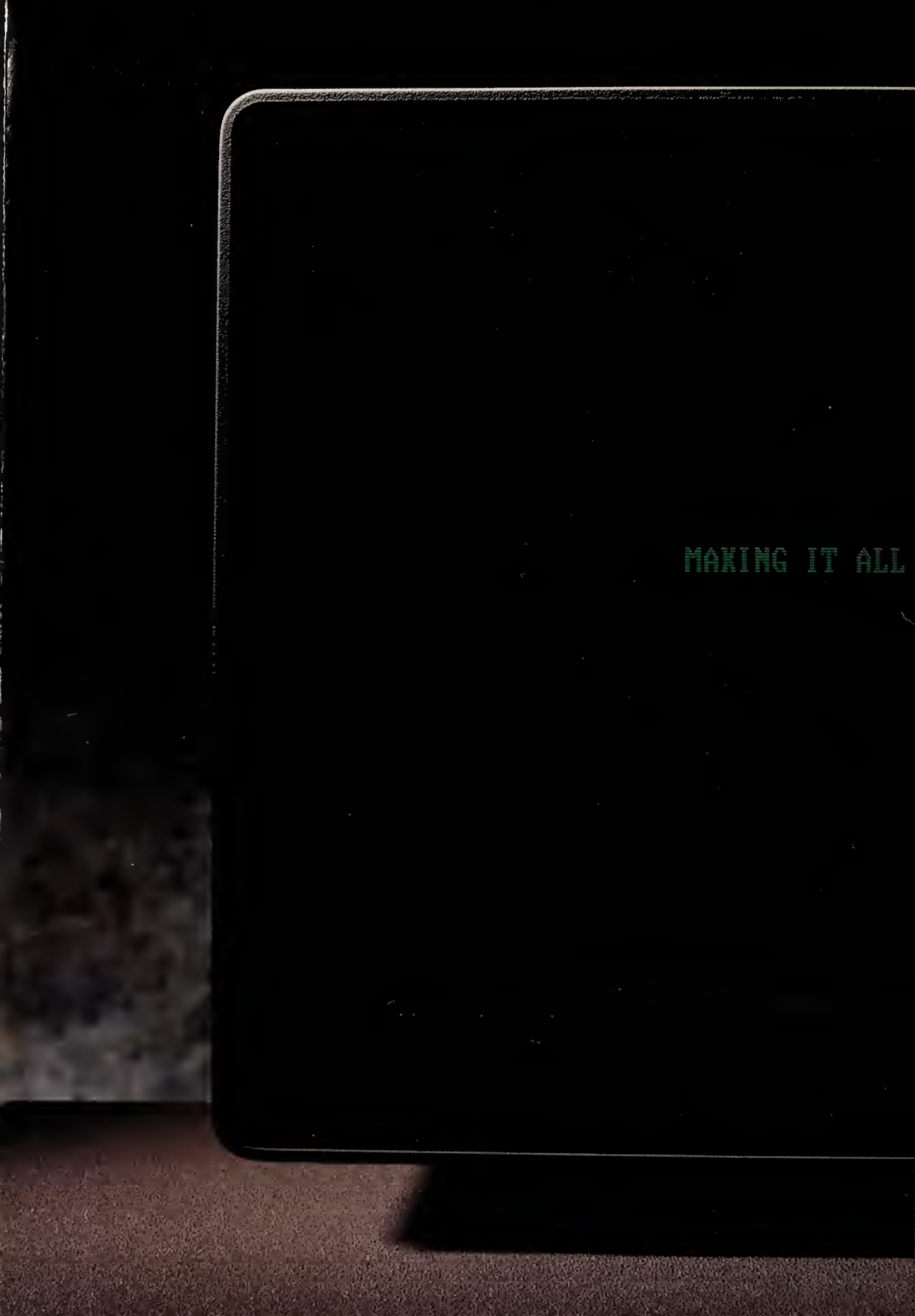
A second machine is used in the computer sciences department, where it is part of a project to develop an American National Standards Institute standard for imaging software, and the third is located in a research center where it is involved in various productivity-enhancement projects. Additionally, both machines are used for other "compute-hog" activities, Costello said, such as real-time finite-element modeling and real-time structural solids modeling.

At each location, the GS1000 is hooked into a network of the department's other computers, including a series of workstations produced by Digital Equipment Corp., Apollo and Raster Technologies, Inc. In such situations, the machine's bandwidth — the GS1000 contains a data path that transfers data to and from the main memory and cache memory at 512M byte/sec. — comes in handy.

The system's microprocessors are also configured to perform parallel processing, which Costello said he hopes to explore in earnest in the next few months.

The future of personal computing now rests on just one thing.

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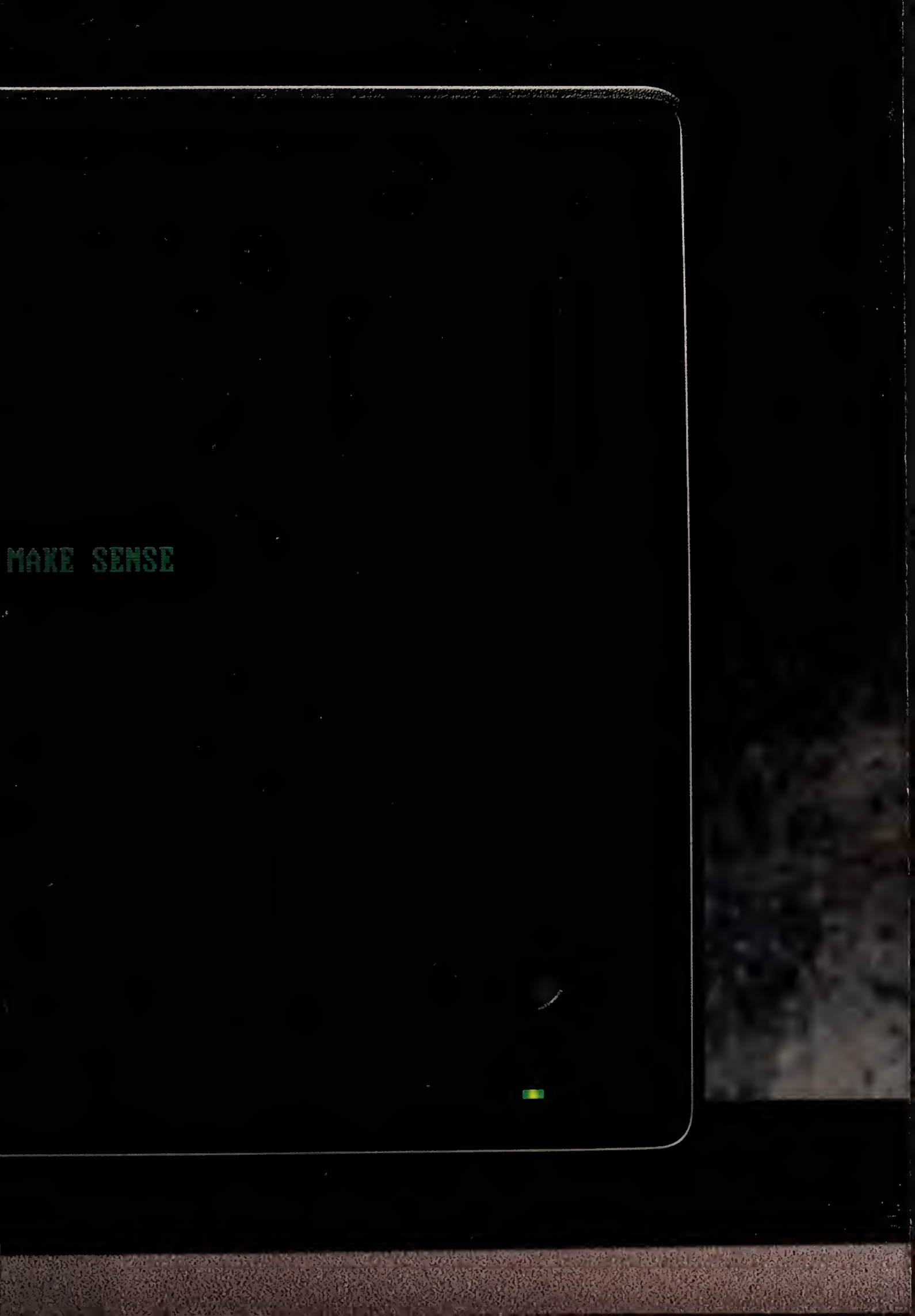

MAKE SENSE

At Microsoft, first we make it possible.

If you happened to catch the January 1975 issue of *Popular Electronics*, you were one of the lucky few to witness the debut of the personal computer.

Impossible as it seems, a magazine with less than one-tenth the readership of *Time* or *Newsweek* launched a technology race roughly parallel to that of the space program.

The world wasn't waiting. We were. The PC makes its debut.

It also launched a company that immediately assumed center stage in the exciting new world of personal computing. The company was Microsoft, and the tenet upon which it was founded was a simple one. To see a computer on every desk and in every home.

To take that rudimentary new contraption that was the early personal computer and turn it into the powerful machine that has literally changed the way we work, required some important steps. The first order of business was to create not simply products, but standards. Microsoft® BASIC became the first universal programming language for the personal computer. And set a standard upon which an industry could grow.

Next came what is now the world standard PC operating system, MS-DOS®, developed by us and chosen by IBM for its first personal computers. Today, 20 million machines run on it, and so does a billion-dollar software industry.

And when the Macintosh® was being developed, we were there. That early participation allowed us to write its richest and most important software. These crucial pieces include the powerful

Networking made practical, with software d[illegible] network.

Microsoft Word, the much-applauded Microsoft Excel, and Microsoft Works, the single-solution program for the diverse needs of small business.

As we were contributing to the development of the Mac®, we were also developing a system to put graphics interface technology into the world of IBM® PCs and compatibles.

The introduction of Microsoft Windows in 1985 meant that an easy-to-understand desktop graphical environment now appeared on PCs. Ultimately, this friendly screen will forever replace the cold theater of character-based computing.

But Windows is more than just a useful tool. It is an important technological feat, one that becomes critical to bringing into final focus that original Microsoft vision. Through Windows, any number of software applications will seamlessly integrate. Sophisticated spreadsheet programs. Powerful word processors. Interactive databases. All effortlessly accessible.

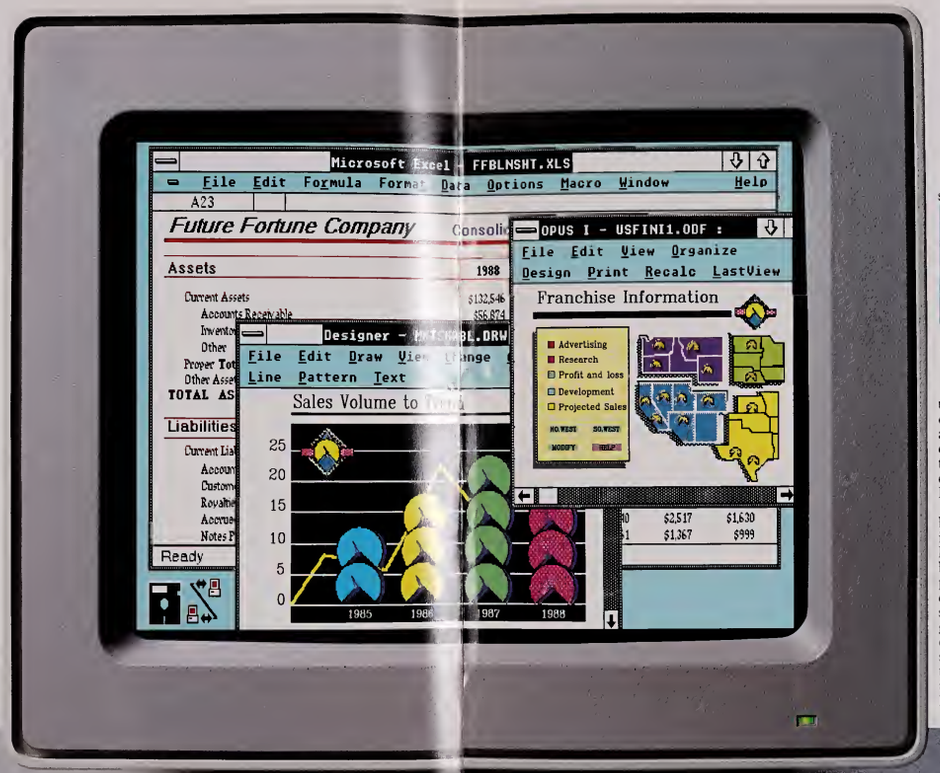
And in MS® OS/2, the new operating system we developed jointly with IBM, the Windows technology (called Presentation Manager) gets even more exciting. Opening up megaamounts of power and memory. Opening up your screen to do several tasks at once. And opening up endless possibilities for developers using the Microsoft family of languages.

But all this doesn't end at the desktop. With Microsoft OS/2 LAN (Local area network) Manager, it's as easy and natural to work on a network as it is to work alone. By linking users via software, information can be shared and exchanged by members of a group. Projects are worked on together, instead of bit by bit. It's amazing how a computer communicates once it's linked by electronic mail.

There is no question that the increased productivity springing from today's personal computer is the direct result of our continued commitment to superior technology.

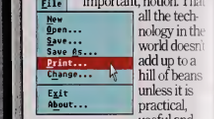
But even so, that's only half of the equation.

MS-DOS with Windows. Mac. MS OS/2. Three ways to go. One driver. Microsoft.



Then we make it practical.

The philosophy behind Microsoft includes another, equally important, notion. That all the technology in the world doesn't add up to a hill of beans unless it is practical, useful and, above all, easy.



Easy commands from pull-down menus make window-shopping easy.

Unless it makes sense.

That's why, whether you're using a Microsoft application on a Mac, an MS-DOS or even an OS/2 machine, it will have a comforting familiarity. Because today's computers share a common software guardian. Microsoft.

Thanks to our groundbreaking work on the graphical interface for the IBM PC and its compatibles, virtually every personal computer can give its user a simpler way to get a lot more done. With a screen that thinks in pictures instead of words, arranges like papers on a desk. Naturally working with pictures makes the work you turn out much more interesting. Which is why the introduction of Microsoft Windows to the IBM PC and compatibles brought with it a whole new category of software with impressive credentials. Like

desktop publishing. And presentation applications that let you create a sophisticated graphics show, from your office instead of the art studio's.

With Windows giving laser printers their marching orders, all manner of documents take on a more finished look. And no matter what application you're using, Windows will take over the job of running your printer.

There is also a hardware complement to graphical applications: the Microsoft Mouse. An unprecedented 1.5 million users have found that a simple point and click eliminates complicated keyboard commands.

Our Windows spreadsheet

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program, Microsoft Excel, goes so far beyond just simple number-crunching that it has received unparalleled acceptance in corporate America. More powerful than any other, it also easily delivers sophisticated charts, graphs, text and data pulled simultaneously from several sources. And to make it even easier, we built it to graciously accept files and macros from other programs.

The new generation of PCs will run OS/2 with Presentation Manager, taking our graphical screen to even greater heights. By unlocking the capability of these machines, users can easily switch between programs almost instantly. Members of a workgroup can work together on an unlimited number of tasks.

A simple point and click replaces mumbo-jumbo keyboard commands.

And finally, every kind of program, from spreadsheets to electronic mail to word processing, works in a common way. To the user, learning one is a quick step toward learning them all. To the corporate bottom line, it means far less valuable time and money are spent on training.

But the real practicality of the graphical user interface comes to life when, inevitably, it appears on every computer screen, everywhere. And networking becomes not only possible, but required in this competitive world.

When you think about it, the goal Microsoft set in 1975 of seeing a computer on every desk and in every home seems close at hand. Because, at Microsoft, our fierce pursuit of technology comes with a promise to keep.

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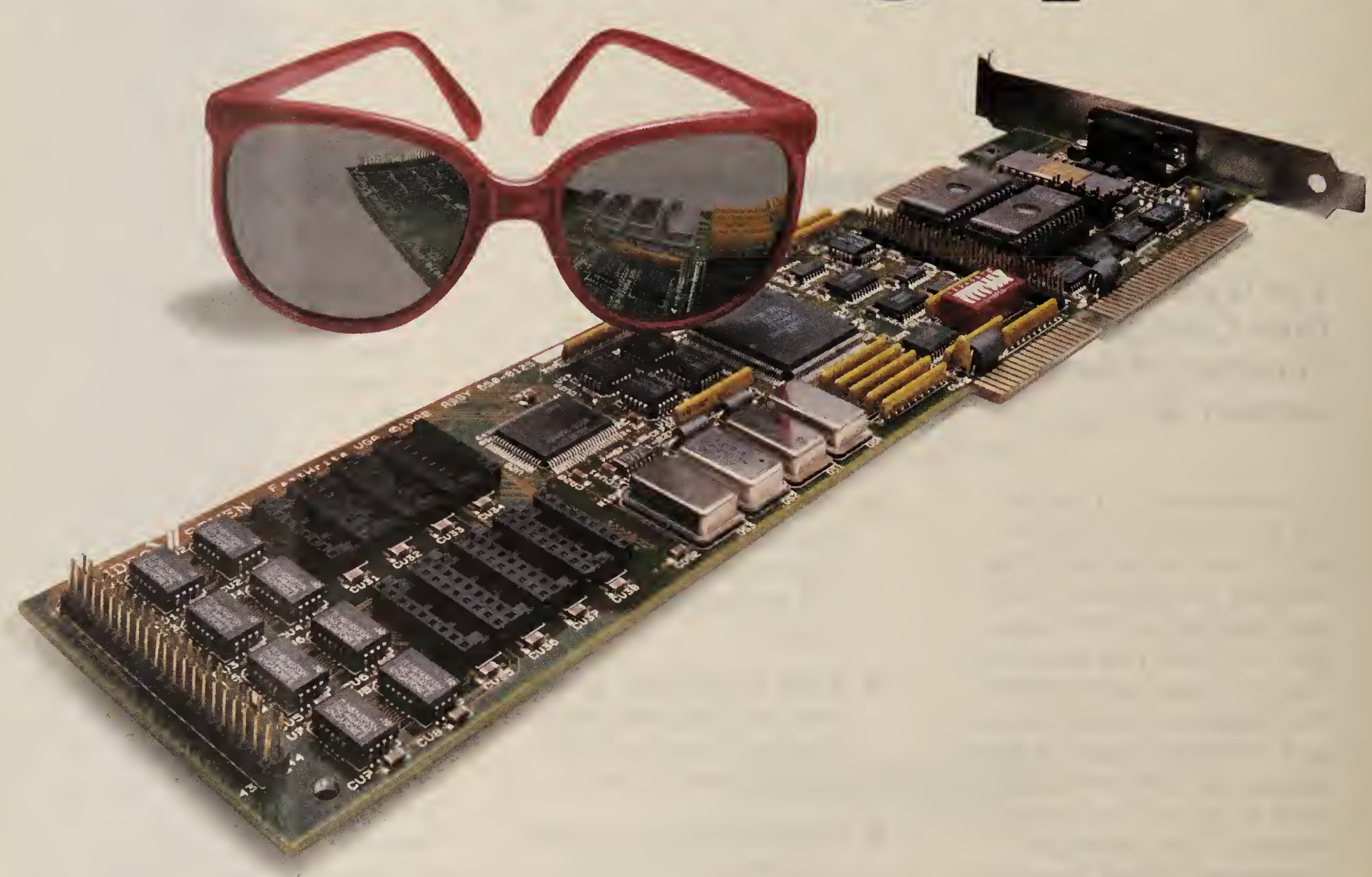

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VSE users

FROM PAGE 29

do not have a replacement out there right now," the IBM manager said. "We did a lot of things to VM because we thought we had a departmental strategy [that emphasized VM]. We got overshadowed in VSE land."

The change in attitude on IBM's part was evident at a recent Common users group meeting in Toronto. Common consists of IBM mid-range system customers.

Denny Pasternak, Common project manager of IBM 370 architecture, said that in the past, IBM would routinely reject enhancements recommended by the group. Now, however, the company is accepting them, meaning that IBM agrees to seriously explore offering a solution.

New lease on life

Despite its new lease on life, VSE is still wreathed in some ambiguity because it is not within the fold of IBM's Systems Application Architecture, and there are no plans to include it.

"No one would be happier to announce full SAA compliance than I would. But it's a question of where we want to spend our development dollars," the IBM manager said.

Achieving full SAA compliance would require a major, difficult rewrite of VSE, and IBM is doubtful that it would be able to recoup its development dollars in license fees, he indicated.

One user who runs a 4381 voiced a more cynical point of view: "IBM admits right up front that they are a high-margin company. VSE users are low-margin customers," the user said.

Making the operating system fully SAA-compliant would require adding CMS or TSO on VSE, the IBM manager said.

"There are not a lot of VSE users asking for those on VSE," he said. Users are committed to VSE for transaction processing, a role that IBM is comfortable in supporting, he asserted.

In September, IBM told users how to program their CICS applications to be in conformance with SAA without actually anointing VSE or CICS/VSE under SAA. Such a half measure will satisfy most user needs, particularly when the functionality of an SAA-compliant intelligent workstation — for example, the Personal System/2 under OS/2 — is added to the equation, the IBM official said.

"What they [users] want in VSE is a common user interface and common dialogue management. It will be implemented by the intelligent workstation."

IBM is embracing VSE — in its own manner — for the sake of the large group of mid-range 4381 processor users, as well as entry-level customers who may be attracted to the 9370. Because of the cost and difficulty of using MVS, hardly any 9370 customers are using it, although it technically runs on the processor.

"Our position now is that VSE provides entry into the 370 platform. And as users grow, they can grow within VSE and then migrate to MVS," the IBM manager said.

He also pointed to an unattended operation feature under VSE, which was announced in September, that he said will help boost the 9370 as a distributed processor in large accounts.

Users welcomed the change in posture by IBM at the last meeting of the large-systems users group, Guide, Inc. At the previous Guide meeting in Los Angeles in March, a white paper on VSE was presented, which included a number of "requirements," Guide's term for important customer needs.

In the year preceding that particular Guide meeting, one VSE user created his own patch, which circumvented VSE's 16M-byte virtual memory limit. The user, Peter Clark, a database and data communications administrator at Olan Mills, Inc. in Chattanooga, Tenn., made the patch available to other users free of charge [CW, Dec. 21, 1987]. Subsequently, IBM announced Version 3.2 of VSE with a similar capability.

Patchwork

Although National Wildlife's Dodge is using Clark's patch, he will be ordering the IBM version because he wants IBM to fully support the software, which it has declined to do if modifications such as Clark's are used.

Although users greet IBM's new posture, they are saying emphatically, "Don't stop there!"

"The single most important thing IBM could do for VSE users would be to get Power [a VSE spooler] and VTAM to run in private address space. They are still limited to the 16M-byte address space, and they use up a lot of it," said Bob Fairbank, a systems programming manager at Blood System, Inc. in Scottsdale, Ariz.

"The 16M-byte limitation must be addressed," Dodge agreed. "I hope they are moving VTAM into its own address space," he added.

Supercalc

FROM PAGE 29

spreadsheet product is well entrenched in the VAX market, and Lotus Development Corp. has plans to bring out a VAX version of its 1-2-3 spreadsheet.

According to Wasilko, the spreadsheet will appeal to distributed VAX companies that want a host repository to collect personal computer spreadsheets, as well as those that simply want to use the VAX for spreadsheet applications.

The Supercalc spreadsheet package joins CA's Masterpiece financial software (acquired with the Software International Corp. purchase), Archiver and Netman systems software, CA-Dissplа, CA-Tellagraf and Graphics Connection graphics software. The package will cost from $2,850 to $16,830, depending on system configuration.

CA's strategy is to integrate its VAX software with DEC's All-In-1 office software and the RDB database management systems. CA will support Decwindows as well, with a PC graphics package slated for its Decwindows debut. CA plans to broaden its VAX line to equal that of its IBM mainframe product line, according to Wasilko.

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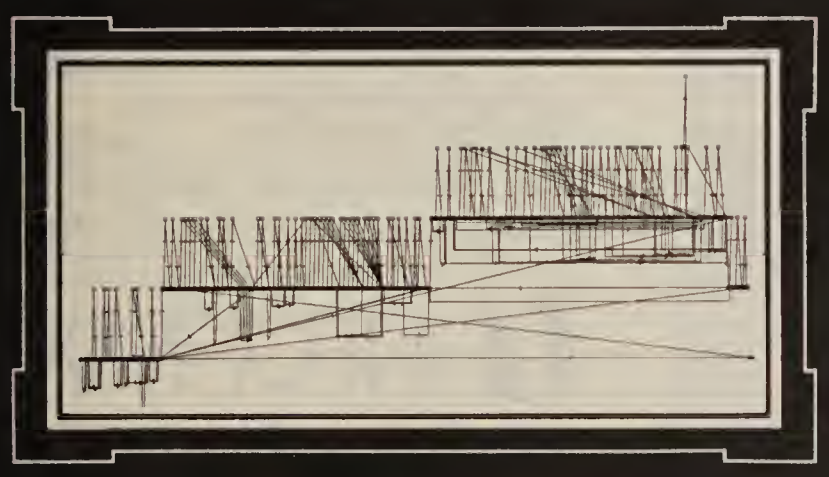

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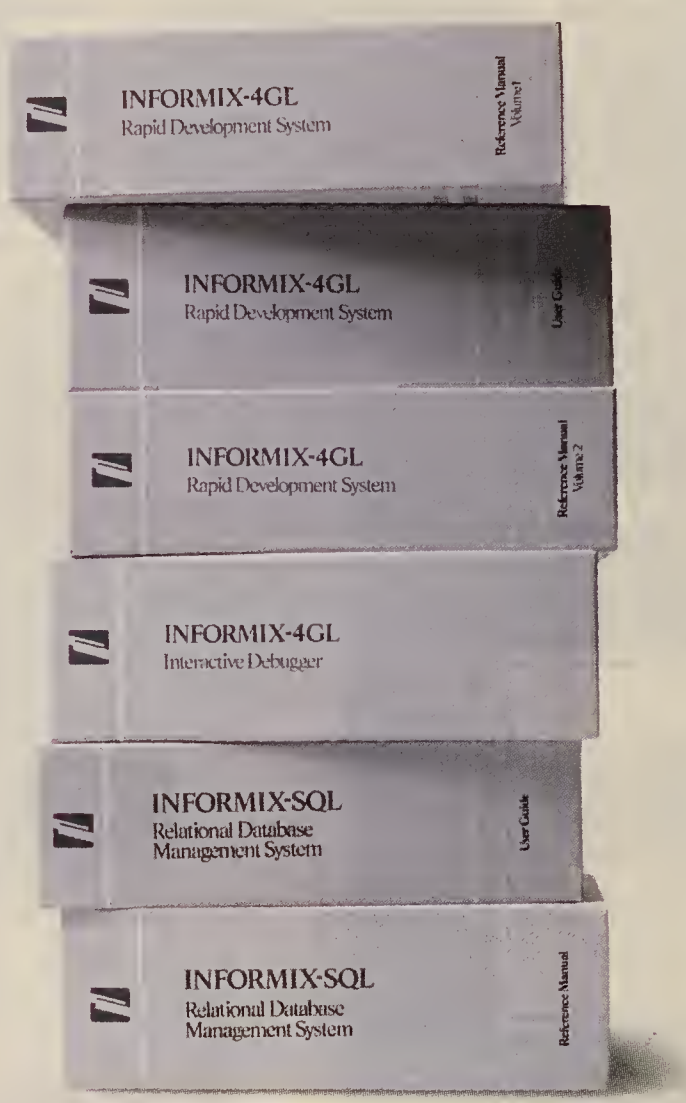

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Hamilton

CONTINUED FROM PAGE 29

ling reason, well, IBM will sometimes do little more than wish a user good luck.

In other words, if a user has no immediate plans to move to the new, strategic IBM mid-range platform, he may not get the kind of top-notch service the company is so capable of providing.

There's a lesson to be learned here, and interestingly, IBM is the one teaching it. If only it would carry the example of the AS/400 user base to other user communities.

Not that IBM should be bending over backwards for System/36 users as it has with AS/400 users. From a business point of view, it wouldn't make sense for the company to be providing all sorts of incentives for users to stay on the System/36 platform.

But it doesn't make sense, either, for IBM to work against itself. The company should clearly see from its AS/400 experience that a little goodwill goes a long way. The same would happen with System/36 users.

In the case of AS/400 sites, I've found people who are understanding of IBM when it comes to system glitches or outright mistakes. One user said he thought IBM has done a great job, considering that there are so many AS/400s already installed and that users have been trying all sorts of tricks with them. Another user told a story of how his AS/400 order was lost, and after several weeks he had to reorder the system. This sort of mistake can fill a user with rage, and rightly so. But in this case, the customer was not bothered much at all. IBM, to right its wrong, installed the system for this user once it arrived.

Now back to that New York System/36 user. He's not very understanding of IBM at all. He had to do a lot of extra work, such as calling industry publications and users groups, just to get a few names of Mapics II users. He said IBM won't talk to him until he writes a check for the new software. And since he thinks IBM put up a wall to prevent him from getting Mapics II information, he suspects that this software must be no good.

That's what happens when a company doesn't spread goodwill. And maybe the New Yorker will remember this incident when he decides to upgrade his mid-range system, whenever that may be.

Hamilton is *Computerworld*'s senior editor, systems.

Gibson

CONTINUED FROM PAGE 33

Maybe more important is that each vendor can convince the world that none will have more applications than it will. In the next year, we will see if DEC's ability to work with software vendors matches its ability to announce agreements.

Council dues due

While IBM and DEC are trying to convince the world that they cannot be beaten in software, they will be working with a number of other firms on the Transaction Processing Performance Council to develop transaction processing benchmark standards.

Apparently, the $5,000 membership fee the council requires was no obstacle to the multibillion-dollar companies.

But some council members are reportedly a little miffed that the group's organizer, Omri Serlin, is charging membership dues by calendar year, not according to the anniversary of the formation of the group or a member's anniversary of joining. Thus, all members who joined after the group's formation over the summer will reportedly have to pay another $5,000 on Jan. 1.

Rumblings are that some members hope a relevant benchmark can be agreed on this year so they don't have to sign on for another 12 months.

Gibson is *Computerworld's* senior editor, software.

Superconductor

CONTINUED FROM PAGE 29

ogy (ECL), using superconductive materials in chips would reduce the power requirements immensely. According to Moll, a CMOS chip requires between 3V and 5V, while ECL requires between 0.5V and 0.08V. A superconducting chip, he said, would likely have a power requirement of only 0.0005V.

With the smaller voltages, circuits could be more densely packed without danger of cross talk or data-garbling interference as electricity races through the chip, according to Cutler.

Quantum leaps

The lab is expected to be completed early next year. While experimenting with the right blend of materials to promote superconductivity, the lab's biggest hurdle will be building a junction to act as the basis for high-speed logic switching. Moll said that that issue will not be addressed until late in the 1990s. In the meantime, "we'll be pushing the limits of quantum theory," he said.

If the lab had its dream superconducting computer, it would be likely to emerge first as a "very high-speed math co-processor," Cutler said.

Superconducting materials could allow for a one-chip CPU, according to Moll, but "you still have to have several hundred megabytes of memory, and we don't know how to apply superconductors to memory," he said.

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Guglielmi

FROM PAGE 33

vendors access to [AS/400s] to convert their applications prior to announcement. That happened with our vendor support operations. AS/400 was the model for what you can expect from ASD in the future — we will have our own set of applications, but we will have a complement wherever we can of third-party applications.

On the subject of vendor alliances, you said about a year ago that we would be seeing additional relationships announced that were similar to the Hogan Systems relationship. Nothing of that nature was announced this year, though.

There is one, actually more than one. But the one that was most visible is our relationship with Metaphor Computer Systems, Inc.

We haven't heard much about that.

First, let me put what I said in perspective. I think I said a year ago that the Hogan model was one that we thought was very important to us and the third-party software industry — that is, going out and forming a relationship where clearly there was excellent technology already available.

I want to talk more about Hogan. While it got off to a slow start, I'm very pleased with where that product is today and the progress we're making.

I've said we've done more. You haven't seen them all yet, because they will be announced as we announce products.

But the most visible was with Metaphor. What it is is a decision-support system that is fully icon-driven . . . and we are in the process of working on that and are preparing to announce and deliver a product that does all it's been doing on [Metaphor's] unique hardware to the PS/2 line.

How would you sum up the Hogan deal?

First of all, when I said Hogan was a model, I meant that we would find ways to provide third-party technology, under IBM's logo or not, to our customers. The terms and conditions that we do business with under the Hogan relationship, and those with others will vary. I said that a year ago. I didn't mean to imply that that precise business arrangement was one that we would always rely on. So the point was, with Hogan, that we were not necessarily going to do our own development on everything anymore. We're going to depend on third parties, and that's what I meant by the model.

There's been a long-standing point of view in the industry that IBM doesn't really know how to sell software because its salespeople are so oriented to selling hardware and that it will take a long time before IBM is really effective at selling applications. What's your response to that?

First of all, I hear that all the time. To some extent, our focus in the corporation over the last four or five years has been on the technology platforms. One of the reasons ASD reports to the marketing group is to ensure that I have leverage in effecting change in our market support structure. And we have aggressively put in place both education and technical support structures to get the right focus in our field and field support areas.

We are in the process of organizing our field and our direct sales force along industry lines. Along with that comes an industry set of support plans and education. We're in the process of educating the field force not only on the industry-specific application sets but on IBM and third-party software where it makes sense.

We're aggressively using more third-party skills and providing support to our field organizations so people who understand their niche markets are available to IBM salespeople and support people to make joint calls and to allow our customers to see the application alternatives available.

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NEW PRODUCTS — SYSTEMS

Data storage

Unisys Corp. has introduced several magnetic tape products for its A and V series mainframe systems.

The announcements include the **5073/0899** controller and dual drive, an **Automatic Cartridge Loader** (ACL) for the 0899 dual drive and the **2145 GCR** tabletop unit. Deliveries on all these products are scheduled for the fourth quarter.

Prices for the 5073/0899 on A and V series systems start at $165,264 for a basic system consisting of one controller, four transports and one host interface connection. The ACL is priced at $8,900, and the 2145 GCR on the V series costs $17,500.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-5367.

A disk controller for deskside and server systems has been announced by **Sun Microsystems, Inc.**

The **SMD-4** 32-bit bus controller and **688M-byte disk drive** were designed for the increased processing power of the SunOS 4.0 Unix operating system and the Sun Scalable Processor Architecture-based Sun-4 workstations and servers, the company said.

The SMD-4 is a full-height VME module with a 128K-byte read-ahead cache. The module is priced at $4,500 in a stand-alone configuration. The 688M-byte disk drive subsystem includes the SMD-4 controller and a small-footprint pedestal and has a price tag of $19,000.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043. 415-960-1300.

I/O devices

Applied Digital Data Systems, Inc. (ADDS) has introduced two terminals that were developed to complement the Digital Equipment Corp. video display environment.

The **3320** is a compatible enhancement to the DEC VT320, and the **3320 Touch** offers all the same features as the 3320 plus a touch-screen user interface, the vendor said. Both units incorporate a 70-Hz refresh rate and a 14-in. flat-faced CRT available in green, amber or white.

The 3320 is priced at $695, and the 3320 Touch costs $1,595.

ADDS, 100 Marcus Blvd., Hauppauge, N.Y. 11788. 516-231-5400.

Xerox Corp. has rolled out a pair of high-end laser printing systems that it trumpets as the first production printers to approach offset printing standards.

The **Xerox 4650 Professional Printing Systems** and the **Xerox 4090 Laser Printing Systems** enable host mainframes, minicomputers, workstations and networked personal computers to produce publications in a variety of fonts and styles, the firm said.

The high-end 4650 features a resolution of 600 spot/in., the company said, and includes 340M bytes of storage and print speeds up to 50 page/min.

The 4090 features two 170M-byte hard disks, prints at speeds of up to 92 page/min and sports a resolution of 300 spot/in.

The 4650 will be reportedly available in the second quarter of 1989. A typical system with graphics capability starts at $171,000.

The 4090 is available immediately and is priced at approximately $190,000.

Xerox, 101 Continental Blvd., El Segundo, Calif. 90245. 213-333-7000.

Power supplies

Instrumentation and Controls Systems, Inc.'s Electro-Pac division has announced the **Lifeline II Uninterruptible Power System.**

Designed to provide battery backup for up to 25 min, it reportedly contains a power conditioner and pulse-width modulated technology functions. It can power up to four IBM Personal Computer XTs or one minicomputer and costs $2,780.

Instrumentation and Control Systems, 520 Interstate Road, Addison, Ill. 60101. 312-543-6200.

An uninterruptible power supply device designed specifically for IBM Application System/400 minicomputers has been announced by **Clary Corp.**

Clary's *Onguard Series 400*

According to the company, The **Onguard Series 400** is available in tap-selectable inputs of 208V, 220V, 230V, 240V or 250V AC and 50 or 60Hz and supports a terminal and a modem.

The product reportedly requires no additional electrical wiring for installation and is priced at $7,190 in its base, single-module configuration.

Clary, 320 W. Clary Ave., San Gabriel, Calif. 91776. 818-287-6111.

Emerson Computer Power, a division of Emerson Electric Co., has announced an application-oriented family of uninterruptible power systems for use with IBM's line of Application System/400 mid-range computers.

The **Accupower/400** series accommodates full-rack expansion requirements and includes all power distribution components, connectors, circuit-breaker protection and electrical interfaces necessary for installation, the vendor said.

Prices start at $3,800.

Emerson, P.O. Box 1679, 3300 S. Standard St., Santa Ana, Calif. 92702. 714-545-5581.

Constant Power Corp. has announced the **Unac 400 Uninterruptible Power Source.**

The on-line unit supplies a pure sine wave voltage output and is rated at 400 kVA, according to the vendor. It incorporates three protected outlets and two conditioned outlets that are controlled by individual front-panel switches.

The Unac 400 is priced at $995.

Constant Power, 7853 Balboa Ave., San Diego, Calif. 92111. 619-279-8447.

Maintenance equipment

Beckman Industrial Corp. has added the **Easy BOB Models 775** and **785** to its existing line of breakout box products.

According to the vendor, the 775 is a battery-powered box that can monitor and reconfigure all 25 incoming and outgoing RS-232C lines for positive and negative voltages. The handheld 785 is reported to be a combination breakout box and full-function cable tester that simultaneously sends and receives test voltages.

The BOB Models 775 and 785 cost $299 and $345, respectively.

Beckman Industrial, Suite 1020, 15760 Ventura Blvd., Encino, Calif. 91436. 818-990-1235.

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NEW PRODUCTS — SOFTWARE

System software

Software designed to verify the availability of both hardware and software components in an IBM VM system configuration has been announced by **Duquesne Systems, Inc.**

According to the vendor, **Checkout/VM** automatically probes the VM system for down components, restarts them if necessary and notifies the appropriate staff of component failure.

Checkout/VM is priced between $6,000 and $18,000, depending on CPU class.

Duquesne, 2 Allegheny Center, Pittsburgh, Pa. 15212. 412-323-2600.

A data encryption tool for Digital Equipment Corp. VAX/VMS systems has been announced by **Prime Factors, Inc.**

Called **Descrypt Plus**, the product is reportedly based on the U.S. government-approved Data Encryption Standard and will secure communications between any IBM mainframe and DEC VAX machine, as well as all VAX-to-VAX communications, the vendor said.

Descrypt Plus licenses cost $1,800 for Microvax systems and $4,500 for all other VAX computers.

Prime Factors, 1470 E. 20th Ave., Eugene, Ore. 97403. 503-345-4334.

Database management systems

Laticorp, Inc. has released **Textbase 1.2**, a database management system that runs on Digital Equipment Corp. VAX/VMS computers.

Designed specifically for electronic text, the software reportedly searches free-form text based on content — not on form.

The product can be used to search court transcripts, tax law, waste disposal regulations, engineering notes and other activities that require specific data from large text records.

Scheduled to ship Dec. 30, Textbase 1.2 is priced from $1,495 to $71,995, depending on hardware platform.

Laticorp, 185 Berry St., San Francisco, Calif. 94107. 415-543-1199.

Interbase Software Corp. has announced a front-end graphical database tool that was designed for users in a workstation environment.

Pictor reportedly enables both engineers and end users to access and manipulate data without having to learn SQL commands or other data manipulation languages.

According to the vendor, the product runs on Sun Microsystems, Inc., Apollo Computer, Inc. and Digital Equipment Corp. machines.

Pictor costs $1,400.

Interbase, 209 Burlington Road, Bedford, Mass. 01730. 617-275-3222.

Candle Corp. has announced **Omegamon for DB2**, a real-time performance monitor for managing IBM's DB2 relational database management system.

The product is aimed at application programmers, database administrators and operators and can be accessed from dedicated, VTAM and TSO modes.

Omegamon for DB2 costs $30,000.

Candle, 1999 Bundy Drive, Los Angeles, Calif. 90025. 213-207-1400.

Applications packages

Palette Systems, Inc. has announced an **Electronic Work Instruction** module for use with Digital Equipment Corp. workstations.

The product was designed to give planners and production engineers a desktop publishing-like environment for preparing, editing and distributing illustrated work instructions and process plans on the DEC workstation platform. The menu-driven system reportedly includes an integrated graphics database and hypertext functions.

A typical Palette system with the Electronic Work Instruction module is priced from $50,000 to $500,000, depending on hardware configuration.

Palette Systems, 6 Trafalgar Sq., Nashua, N.H. 03063. 603-886-1230.

Britz Publishing, Inc. has released **Version 3.0** of its **Art** accounts receivable system.

The software runs on IBM System/36 and Application System/400 mid-range processors and includes data entry, invoice printing, accounts receivable ledger and transaction history functions.

Art 3.0 costs $99 and includes complete RPG-II source code.

Britz, 1814 Capital Towers, Jackson, Miss. 39201. 601-354-8882.

Incase Corp. has released **Version 2.0** of **Engarde**, a system security analyzer for Hewlett-Packard Co.'s HP 3000 minicomputers running MPE V.

The latest version reportedly features improvements in documentation and online Help, as well as expanded file analysis capabilities.

According to the company, Engarde 2.0 is priced at $1,495 for the first copy and $1,050 for each of the next three copies.

Incase, Suite 171, 2055 Woodside Road, Redwood City, Calif. 94061. 415-369-1942.

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MICRO BITS

Douglas Barney

Manzi's no Ebenezer

Manzi — He-man or Human? Mary Perella has read the things written about Lotus Chairman Jim P. Manzi. The stories have called him ruthless, sarcastic, tough and abrasive. It was as if the writers looked up "jerk" in a thesaurus and copied down all the synonyms. Every time Perella brings herself to read this stuff, the same thing happens: "Smoke comes out my ears," she says.

The Manzi in the articles is obviously not the same Manzi that stops by Perella's desk nearly every day to snag a piece of candy and charm her with a joke, a smile. Perella, a Lotus receptionist, uses vastly different words to describe her boss. "He's a doll; a real sweetheart," she says without prompting.

For such a complex individual, those who have profiled Manzi have thought of few ways to describe him, and no one has thought to call him a sweetheart. In fact, writers who don't even know him seem to assume that he is a flat, stereotypical hard-nosed businessman, hardly human at all.

Continued on page 52

IBM publishes OS/2 road map

BY DOUGLAS BARNEY
CW STAFF

Users thinking about OS/2 had better think about megabytes — lots of megabytes. That's what it takes to run this large, advanced operating system with only a few applications, according to IBM recommendations in the firm's recently released "Operating System/2 Information and Planning Guide."

Those interested in IBM's OS/2 Extended Edition need to consider even more megabytes for both random-access memory and hard-disk memory, according to the document.

As co-developer, IBM perhaps knows best what it takes to run OS/2.

Despite the high memory requirements, users can save money by using OS/2's virtual storage capabilities, the guide points out. This technique allows program code to swap between a special file on the hard disk drive and main memory. This is particularly handy for running multiple applications, IBM said.

Most of the memory estimates that follow assume that users are taking advantage of the so-called Segment Swap Data Set. This also allows for multitasking within the given system configurations.

OS/2 Extended, which adds communications and database functions, appears to be the biggest user of memory, according to information in the guide. Using the IBM-supplied worksheets, a micro concurrently running the full version of OS/2 Extended Edition 1.1 would need 8.7M bytes of RAM with a minimum of applications. Want to load it on your hard disk? Best have 36.6M bytes free, the worksheets disclose. And then try to leave some room for additional applications.

This is clearly a worst-case scenario presented in the guide. One of the advantages of OS/2 Edition is its modularity. Users can load only those components

Continued on page 53

Inside

- IBM execs field questions on Presentation Manager. Page 47.
- At Travelers, PCs talk back. Page 47.
- AI package aids training developers. Page 47.

Apple to ally with integrators

BY JULIE PITTA
CW STAFF

LAS VEGAS — Apple Computer, Inc. will seek agreements with large systems integrators to help its new systems integration group serve large corporate accounts, company officials revealed recently.

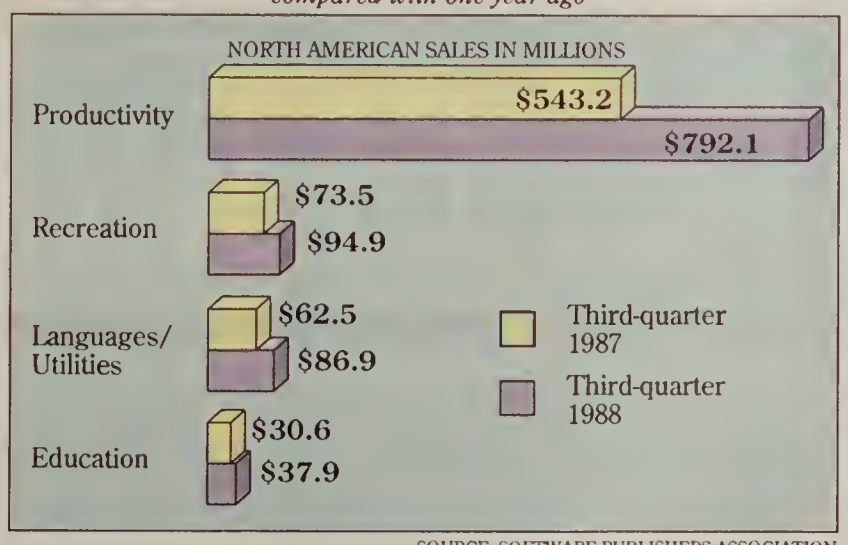
The Integrated Services organization, headed by Chuck Berger, vice-president of Integrated, was announced in April during one of Apple's several reorganizations within the last year.

Continued on page 48

Data View

Productivity makes the most of the market

Productivity packages were the fastest growing among micro software compared with one year ago



SOURCE: SOFTWARE PUBLISHERS ASSOCIATION
CW CHART

Mac lends hand on Latin dig

Field archaeologists catalog excavation data

BY MICHAEL ALEXANDER
CW STAFF

It's not the sort of puzzle that Indiana Jones has had to resolve in popular films, but Robert Sharer, an archaeologist from the University of Pennsylvania, was troubled nonetheless. For some reason, the internal disk drive in his Macintosh Plus was malfunctioning, causing it to eject disks at inopportune times.

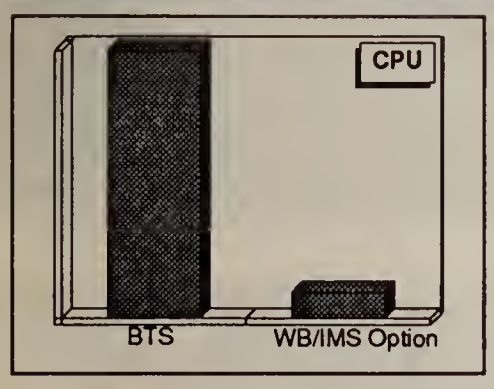
What would Indy have done in the same circumstance? Take the Macintosh to the nearest repair center, of course, and that is what Sharer did.

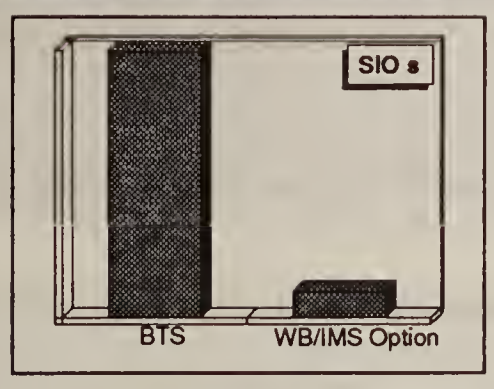
"When the repair guy opened the Mac up, he found a nest of cockroaches in the internal disk drive," said Sharer with a laugh. "I guess they liked the warmth or the noise in there."

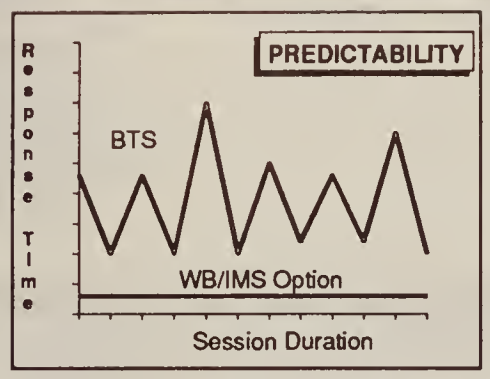
Sharer and his colleagues had recently returned from an expedition to Sakajut, a remote, pre-Columbian dig in the northern lowlands of Guatemala. While on location, they used the Apple Computer, Inc. Macintosh, along with Filemaker Plus, a popular database management program

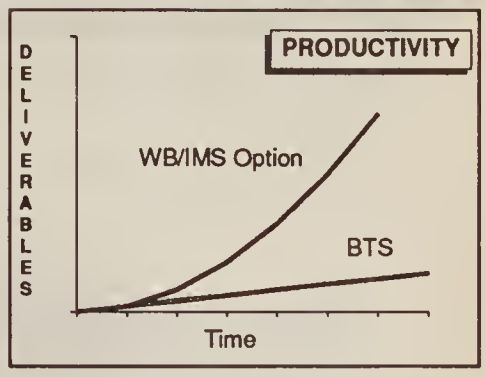
Continued on page 53

Technology Breakthrough: IMS DB/DC on a PC !









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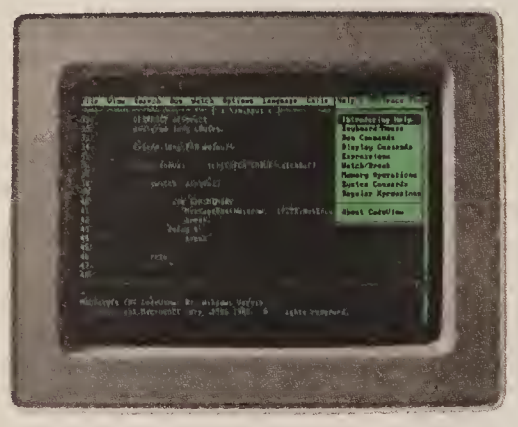
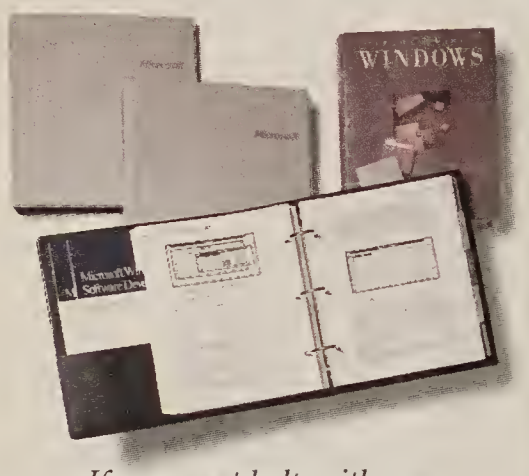
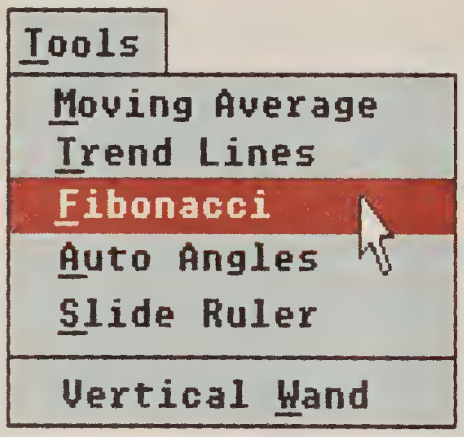
What do you mean yo



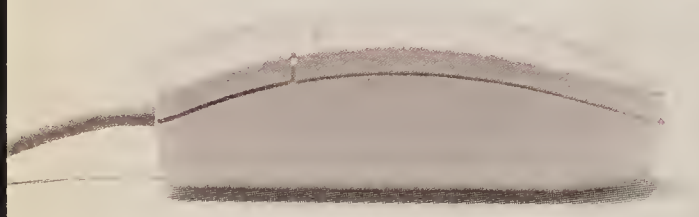
CodeView:
Now appearing in Windows.



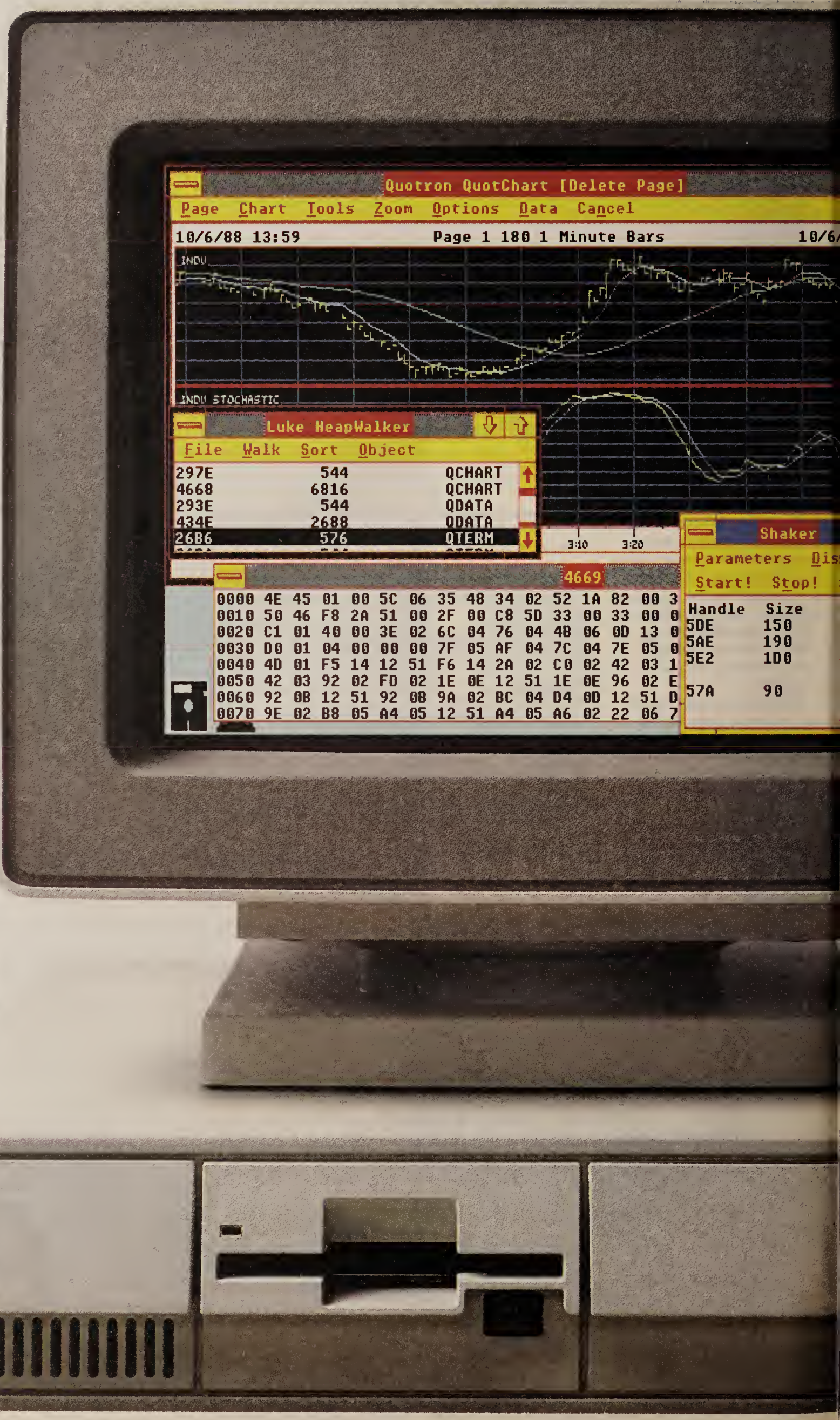
If you want help with your Windows, crack one open.



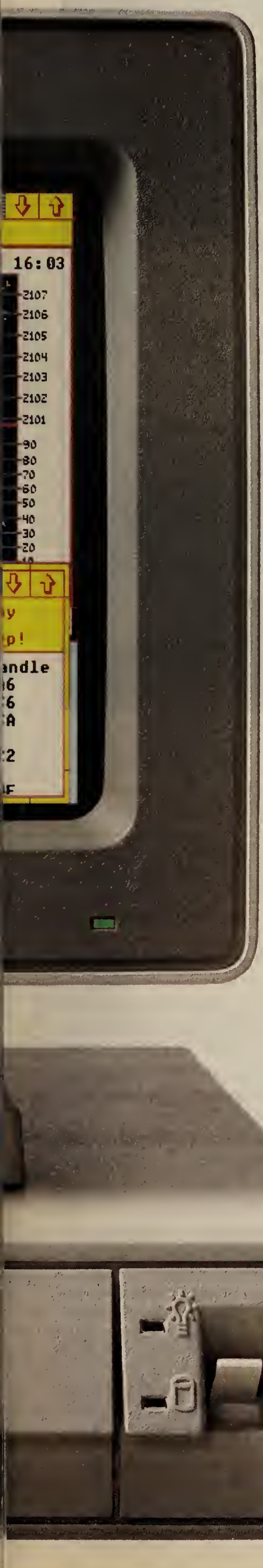
Whip up your own creations.



A helpful little navigator.



ou don't do Windows?



Sure, it's a tough job, but somebody had to do it. As long as it wasn't you.

Well, the news is good. Because developing applications for Windows just became extremely do-able.

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S O L U T I O N S

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SMALL TALK

William Brandel

EISA and coming of age

In September, nine Davids, vowing to knock Goliath to the pavement, invited members of the press to witness the impending bout. Believing they had strength in unity, they tried to convince us that we were about to hear a big thud. The silence has been deafening.

The media, as could be expected, could not resist the makings of good drama: an underdog, a bully, a rebellion — everything but a cameo appearance by Richard Chamberlain.

With a huge media spotlight on them, the Extended Industry Standard Architecture vendors seized the opportunity to make a case for an alternative to the Micro Channel. Led by Compaq's Rod Canion, they said customers do not need or want IBM's Micro Channel and that customers demand natural evolution, not revolution. They gave us claims but, unfortunately, little proof.

Now it looks like IBM has picked itself up and is standing tall. It also looks like the Gang

Continued on page 48

Pman from the inside out

IBM, Microsoft execs on buying memory, why Windows wouldn't work

IN PERSON

The fact that OS/2 Presentation Manager is shipping did not automatically satisfy IBM and Microsoft customers, who immediately started asking tough questions about the state of the product. Users still want to know the basics, such as how much it costs to implement and what exactly this thing will do for them.

Shortly after the Halloween release of this next-generation graphical user interface, *Computerworld* Senior Editor Douglas Barney sat down with Microsoft Corp. Vice-President of Systems Software Steve Ballmer and IBM Entry Systems Division Vice-President of Programming Richard Hanrahan. What follows are their answers to the questions most on users' lips.

Microsoft's Ballmer *(left), IBM's Hanrahan on Pman*

How do you go about cost-justifying the Presentation Manager, and which users would tend to move to it first?

Ballmer: There are really three costs. Most users will have to buy some more memory, and typically you will want three megabytes or so.

Even with multitasking?

Ballmer: With everything, you can get by with two megabytes, but the typical user who moves first will want to run multiple applications and will want the performance. They are likely to buy three megabytes.

Early users will find the training costs fairly negligible. It will be a big change when you try to broaden that to everybody, but we're talking about the initial user community.

The third cost is upgrading or buying new applications. Those costs have been somewhat overstated in the press.

Our own strategy on Excel is to make that moderate in cost. The general practice in the industry will be to not try to charge more for Presentation Manager applications.

The initial users that will move over will be power users — people in the art departments who all day, every day are producing large documents, financial analysts who need to do a lot of analysis and produce great-looking reports, etc.

For the next year and a half to two years, we're talking about a power user community. It will probably not be until sometime in 1991 when that broadens some.

Power users don't have a lot of trouble cost-justifying stuff. And by 1991, I'm hoping that

Continued on page 53

PS/2s at Travelers read aloud to blind programmers

BY JULIE PITTA
CW STAFF

HARTFORD, Conn. — By using a specially equipped personal computer, Chris Donohue can command her PC to read back any data residing on her screen.

Without it, Donohue, a five-year veteran programmer at The Travelers Corp. who is blind, could not do her job.

Donohue is one of four blind programmers at Travelers who has received an IBM Personal System/2 Model 60 that incorporates specialized hardware and software designed for the visually impaired.

The PS/2s are replacing IBM 3278 Model 2 terminals that are equipped with a voice synthesizer box, also designed for the visually impaired.

Blind workers are using a PS/2 with an IBM Screen Reader, a subsystem that includes software and an independent keypad. The Screen Reader allows the user to guide the cursor over portions of the screen he wishes the computer to read. Users can zero in on a character, a line, a paragraph or a whole page.

Digital Equipment Corp.'s Talk Voice Synthesizer, an external box that plugs into the PS/2, allows the system to output the data verbally.

Peter Baldwin, a senior program analyst at Travelers, said that any PC software program can run on the system. Donohue can pop in Lotus Development Corp.'s 1-2-3 to work on a spreadsheet or Wordperfect

Continued on page 52

Knowledgepro tests, tutors, trains

BY WILLIAM BRANDEL
CW STAFF

An artificial intelligence software development package for personal computers is helping end users develop applications for training and knowledge reinforcement.

The product is called Knowledgepro, a knowledge processor with its own procedural language that was developed by Knowledge Garden, Inc. in Nassau, N.Y.

Buzz Woods, an AI intelligence specialist at Olin Research Center in Cheshire, Conn., is using the product to develop a system for controlling and educating on hazardous waste material for Olin Corp. to be bundled into the company's equipment. He is developing an expert system using the Knowledgepro shell.

Woods describes the product as more of an environment rather than a programming language.

"It has about a two-month learning curve, but once you break free, the code just explodes," Woods said. He added that a programmer must first learn the product's syntax, but the tools to assist in programming are easily arranged. Woods sorted through 35 other AI programs, narrowed the list to eight and then viewed demonstrations of them before finally selecting Logicpro.

Knowledge Garden's Knowledgepro

Price: $495

- Based on proprietary procedural language
- Requires EGA terminal
- Features Hypertext

The product is priced at $495, which Woods said is inexpensive in comparison to other AI programs. The vendor's technical support has been solid, he added.

Woods said in order to fully use the product, an IBM Enhanced Graphics Adapter terminal is required. Also, a powerful personal computer is needed to write the code at a decent speed but not to run the program.

Questions on money

Knowledgepro is helping a state of New York social assistance agency determine whether a person is eligible for financial aid through Medicaid at the state's Division of Operations. Mark Krusik, a senior analyst with the state, is using the product to create an expert system to assist state employees in making these determinations.

"Some of the rules we use are very complex, so I decided to try and use a computer to represent a system hierarchy," Krusik said. "For example, under Medicaid's excess income program, we have to identify each kind of bill the prospective recipient owes, whether it is unpaid or is payable under the income guidelines."

Krusik said Knowledgepro is important to the operation because much of the social service terminology is somewhat arcane and requires a definition and example to explain its meaning and significance to employees.

"For instance, what 'viable' means to most people takes on a completely different meaning in government," he said. "It means whether a bill has been paid or can be. With Knowledgepro's hypertext, you can just point to the term. Its definition and relation can then be read by the user."

Reportedly, users do not have to sort through large numbers of files and menus and need only read the information pertinent to their task. The hypertext feature, or thread, allows the programmer to present text in a nonlinear form so that words with associated meaning can be interrelated. The user can display a screen with certain high-

Continued on page 52

Top sellers

Software: Nov. 21-25

1	Lotus' 1-2-3
2	Wordperfect Corp.'s Wordperfect 5.0
3	Ashton-Tate's Multimate Advantage II
4	Software Publishing's Harvard Graphics
5	Fifth Generation Systems' Fastback Plus
6	Microsoft's Microsoft Excel for the Macintosh
7	IBM's DOS 3.3
8	Digital Communications Associates/Crosstalk Communications' Crosstalk XVI
9	Peter Norton's Norton Utilities Advanced
10	Borland International's Paradox 2.0
11	Ashton-Tate's Dbase III Plus

SOURCE: CORPORATE SOFTWARE, INC.
CW CHART

Apple to ally

CONTINUED FROM PAGE 43

Formation of the group is a response to demands from Apple's existing corporate customers, Berger said. Although he would offer no projections, Berger said that he expects the establishment of a systems integration group within Apple will increase the acceptance of the Macintosh in large corporations.

Since the announcement, Apple has significantly altered the structure of the new group. Rather than providing services directly to large end users, Apple will form alliances with large system integrators, Berger said.

Thus far, Apple has reached an agreement with Peat, Marwick, Main & Co. for a single end-user contract. Several other agreements are being negotiated, Berger added.

The marketing executive likened Apple's system integration to its earlier sales tactics for reaching Fortune 1,000 companies. "In the beginning, we had to prove to resellers that they could sell the Mac to large corporations and that it would be profitable for them to do so," Berger said. "Apple sold Macs direct to large accounts in the beginning and has shrunk that team as the resellers have picked up those accounts. Apple needs to do the same with system integrators."

Apple's sales force will act as a referral service to systems integrators, as it has with resellers. Berger said volume purchases will not dictate whether resellers or integrators are referred to specific accounts. Instead, the firm will base such decisions on the amount of customization required by the customer, he said.

"Businessland is not interested in writing code," Berger said. "They don't have the capabilities of servicing these types of accounts."

The engineering team will develop layers of applications for tools such as Macworkstation, a software tool that allows the Mac to retain its graphical user interface when connected to host systems. Also, Apple will recommend third-party products when appropriate, Berger said. The company will contract with third-party maintenance companies to provide service to end users, he added.

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Brandel

CONTINUED FROM PAGE 47

of Nine is about to become the Gang of Whine. Even the strongest media advocates of the proposed bus structure are seeing it for what it is: nothing. It does not yet exist.

The PC industry is a young one, and firms like Compaq and AST Research are on the verge of coming of age. Like young apprentices, they could do well by taking a lesson from Old Man IBM.

IBM consistently refuses to get involved in EISA's petty bickering. It now watches Micro Channel sales chug along and, through product deliveries and demonstrations, tries to vaporize the competition's argument against the Micro Channel line — which just goes to show that rhetoric does not a vendor make.

But how do the EISA vendors react in the line of fire? Two leading clone vendors accused IBM of performing a smear

EVEN THE strongest media advocates of the proposed bus structure are seeing it for what it is: nothing.

campaign against them because IBM commissioned a study whose findings contradict EISA's main argument. At the same time, the group's members now claim that the fashion in which they heralded their proposed bus was in no way intended to smear IBM.

One may question the wisdom and timing of how IBM rolled out its Micro Channel line. Hindsight can make a genius of even the simpleminded.

The company was trying to present to its customers a leadership position and had taken risks in that venture. Sure it was trying to lock up the market; who wouldn't? Isn't that big business? If IBM's customers become annoyed, they turn elsewhere.

The fact of the matter is that IBM took a risk and is playing by the rules. At worst, the company referred to EISA as "a set of flip charts," but it has not smeared anything. It continues to push its own product line. It is behaving like a big person.

EISA's motives are somewhat difficult to ascertain, perhaps because the group lacks leadership. Leadership leaves one vulnerable because it involves risk. IBM is taking its risk, and it appears to be paying off.

So now EISA has made its claim and will face what IBM has endured for 19 months before vindicating itself. EISA's task has been made all the more difficult now that it continues to bring attention to IBM's Micro Channel bus.

Coming of age is painful, even for the most successful and fast-growing firms. Fortitude and dignity — not whining until your argument is proven — will earn you the right of passage.

Nobody is saying that an alternative bus market does not exist — if and when the products arrive. But the burden of proof is on EISA. Running down IBM does not create anything except a big turnoff to customers.

Brandel is a *Computerworld* senior writer.

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And now, our R&D is $1 billion annually. Because, as always, we have to keep creating opportunities for the world's most demanding customers, our future customers.

ALCATEL

Barney

FROM PAGE 43

It is a depiction as narrow as fishing line and just as weak. Yes, Manzi at times can be ruthless, sarcastic and tough. That's why he's the boss. But the image of him that gets presented is mystifying, given the breadth of intelligence, culture and finely honed wit of the man that runs Lotus.

Manzi has suffered in the press because he is not an extrovert, doesn't suck up to those who follow him and doesn't tell us how great we are. And he doesn't seem to let outsiders into his life.

These qualities, however, don't justify the image of a cocky and abrasive bean-counter. Simple bean-counters don't major in the classics, win journalism prizes or run dynamic software companies.

There are a number of reasons Manzi is misunderstood and inadequately defined. One is that he is hard to reach (sometimes), another is he tries to come off as a tough guy (I'll buy that) and, finally, that he is in fact nothing more than a flat, stereotypical business jerk (absurd!).

It is more complex. From all accounts, Manzi has a strong sense of family and did not react well to the magnifying glass that is placed on all high-level executives.

As a matter of fact, Manzi has gone out of his way to protect his family's privacy, even if it has meant failing to invite reporters over for a weekend barbecue.

Manzi also keeps his work in check, rarely toiling on weekends and getting up in the wee hours so he can get home to his kids at a decent hour.

And at 36, Manzi is a youngster compared with most successful U.S. executives. To compensate, some say, he plays up the tough-as-nails image as if to deny being young. It doesn't matter whether Manzi is hiding his essential qualities or observers are simply not looking hard enough; it is really a little bit of both.

Though sometimes stiff in public, when comfortable, Manzi lets his hair down, and a sometimes sinister yet hilarious stream of humor flows out. Manzi himself estimates that he spends between 30% and 40% of his time laughing. After a recent private dinner I had with him aimed at testing the theory that Manzi is not what he is cracked down to be, I have to agree.

It is little known, but Manzi is probably the funniest software executive in the country. When he gets rolling, almost anything — competitors, computers and politics — becomes a target.

Those who followed Manzi in earlier years frequently saw this side of him and described him on the printed page as a fun, kind of offbeat guy.

A 1985 feature that chronicled his rise to the Lotus presidency was filled with Manzi gems. His personal hero was Chico Esquella, an imaginary baseball player popularized on *Saturday Night Live*. "Software has been berry, berry good to me," Manzi quipped. How did Manzi and Mitch Kapor work together? They were joined at the hip, Manzi said.

At press conferences, comments like these still come out, but no one seems to notice.

Manzi hasn't changed one bit since that article appeared. The only thing that has changed is his image. Although he may not show it, Manzi may well be as displeased with that image as Perella is. Fortunately, it looks like he is going to do something about it.

For Manzi, the best move might be back to cracks about Chico Esquella and into a future of letting the real Jim hang out.

On the other hand . . . Bill Gates has long had an image of the gentle master of technology, seeking only the best for the personal computer industry. The fact that Gates smiled a lot helped. But a different, less kind Gates is starting to emerge.

Here are some recent examples. Gates chewed out Ashton-Tate Chairman Ed Esber publicly over Esber's plans to cut Novell in on SQL Server.

Later, Gates flew off the handle over the Next machine. After its flashy debut, he badmouthed it at every turn. He has also blasted Lotus founder Kapor for his plans to make computers easier to use. Gates said that Kapor was meditating while Microsoft was struggling with these ease-of-use issues.

Then, in a personality profile, Gates ridiculed Borland President Philippe Kahn for allegedly bowing to the dictates of Ben Rosen, a Borland board member. Gates implied that Rosen made Kahn raise his software prices.

But in the profile, Gates saved his choicest words for Lotus' Manzi. He made fun of Manzi for his lack of technical expertise and accused Lotus of purposely holding back information on 1-2-3 Release 3.0 delays to freeze the market and selling off stock before the price fell.

Those same allegations are being made in a shareholder lawsuit.

Good thing nobody's asked for Bill's opinion of *Computerworld*. We couldn't handle the abuse.

Barney is a *Computerworld* senior editor, microcomputing.

AI tool

FROM PAGE 47

lighted words or concepts.

By pressing a function key, the highlighted thread, or train of thought, draws on another screen that contains the associated highlighted words.

Knowledgepro is also being used as an intelligent tutoring system to teach ethic work rules and reinforce seminar programs for a defense contractor's employees in Dallas.

Rick Porter, a spokesman at Baker & Co., a consulting firm hired to set up the defense contractor's program, said the artificial intelligence processor is used to present and test prospective employees when faced with ethical dilemmas that may occur while building defense machinery. It then critiques the trainee's response.

"It is especially helpful for the company to test and train employees who may have missed the initial seminars," Porter said.

PS/2s

FROM PAGE 47

Corp.'s Wordperfect to compose a letter.

"Whatever is put on the screen will be spoken," Baldwin explained. "If the computer doesn't understand an individual word, it spells it out for the user." Baldwin said the new system allows visually impaired programmers to compete on an equal footing with their sighted colleagues.

Particularly helpful to Donohue has been access to the electronic mail system developed by Travelers for PC users. "E-mail is a real breakthrough for me," she said. "If I have a quick question, I can get it answered almost instantly. Before, I had to track people down or schedule a meeting."

Prior to receiving her PC, Donohue had colleagues read her general memos, or in some cases, completely missed out on the information. Vital information like project schedules and goals were printed out from the mainframe by a braille printer, a time-consuming process, she said.

"Now our blind users are compatible with their fellow programmers," Baldwin said.

The PS/2 Model 60 requires no customization to work with the Screen Reader or the Talk Voice Synthesizer, according to Baldwin.

The Screen Reader sells for about $600, while the voice unit was purchased for about $4,500, Baldwin said.

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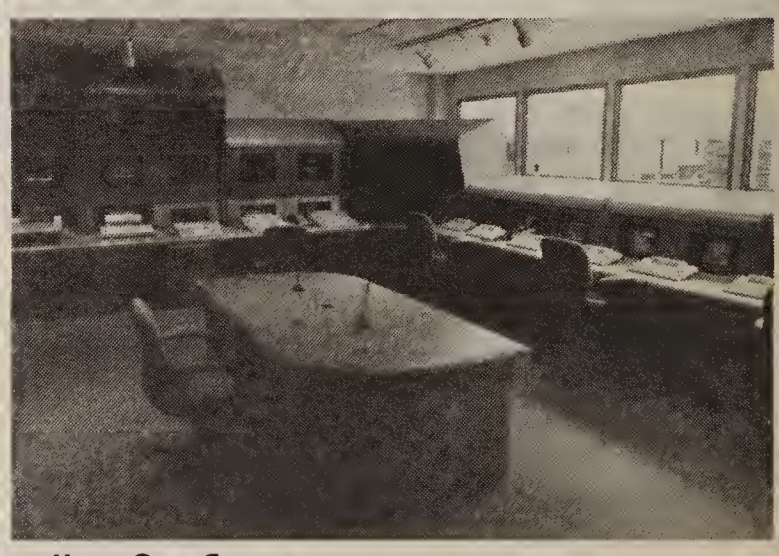

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OS/2 map

FROM PAGE 43

that they need. For example, a user who is interested in OS/2 Extended's database management system capability but is unconcerned about communications can squeeze the program into a system with 5M bytes of RAM and a 30M-byte hard disk drive. As the application grows, those requirements may change.

For those interested only in OS/2 Standard Edition 1.1, the requirements are far lighter. Users can get away with 3M to 3.5M bytes of RAM, even with more than one application, and 15.7M to 17.7M bytes of hard disk. Since most systems come with at least a 20M-byte hard drive, the biggest upgrade cost will be for RAM.

Where the IBM document appears to be less helpful is in determining the requirements for the applications themselves, particularly when users begin multitasking in earnest. Here it will be up to MIS professionals to experiment and then determine their own requirements.

The IBM guide does provide a few quick-and-dirty rules. IBM cautions that when IBM PC-DOS programs are converted to OS/2, they may well require more memory. This is because of the elimination of overlays that allow a large program to fit into the 640K-byte confines of PC-DOS. But because the entire program now fits within memory, performance should increase.

IBM also cautions that an application that fully uses the graphical capabilities of Presentation Manager could boost memory requirements by up to 1M byte. While many users have balked at these memory requirements, just knowing what the requirements are will be helpful for capacity planners.

Latin dig

FROM PAGE 43

published by Nashoba Systems, to record excavation data uncovered at the site.

"I believe we are the first in our area [archaeology] to take the Macintosh into the field," Sharer said.

Many facts — including the condition of the artifacts, their location when found, "virtually everything that we once used file cards for" — are entered into the database, he explained.

The excavation data was entered into the Macintosh each day after the archaeologists returned to their pension in the nearby town of Coban.

Toughness test

The Macintosh was taken on the trip to see how well it stood up under the climate and the vagaries of the local power supply, which varies more than it does in the U.S., Sharer said: "It was a sort of a shakedown trip."

If the machine performed in the field as well as it did in the office, then it would have a permanent place in several expeditions planned for the next few years, Sharer explained.

"We chose it because of our personal acquaintance with it; we had already been using them in our offices at the university," Sharer said. "Also, it is portable enough that you can carry it around."

The Mac performed admirably in the field and withstood the rigors of the test without incident, according to the archaeologist. The recalcitrant disk drive began to act up shortly after the archaeologists returned to the University of Pennsylvania in Philadelphia earlier this year.

Sharer and his fellow archaeologists have made several trips in recent years to Latin America to explore ancient sites, often dating from 400 to 900 A.D. and even earlier. The most recent trip to Sakajut took place from April to June this year.

"One of the major reasons we were there was that it is a key location in relation to some others," Sharer explained. "It was a politically important site, and we had a lot of ideas of its role and historical importance that we wanted to test."

Problem with looting

In addition to using the Macintosh to catalog data about each excavation, the archaeologists utilized the computer to record information about the site's condition and the extent to which looters had damaged it in their quest for valuable artifacts to sell to collectors.

"Looting is a significant problem," Sharer said. "One thing is certain: Looting is like death and taxes and as old as the first tomb. With the value of the artifacts and the number of collectors going up over the last couple of decades, looting has gotten out of hand."

Sharer bought his first Macintosh three or four years ago and has been sold on that system ever since, he said. He and his colleagues have Macintosh SE models in their offices at the university that are used primarily for word processing with Macwrite.

"The next step is to use the Macintosh to take advantage of its graphics and map-making capabilities [of excavation sites]," Sharer said.

The next expedition, to Copan in western Honduras, is slated for January.

"In two years, we'll start work in Lel Peru, which is in the lowlands of Guatemala," Sharer added. "It's absolutely remote, so we plan to bring our own generator to power the Mac Plus."

Pman

FROM PAGE 47

memory prices will be more reasonable.

How different is the Presentation Manager from Windows? Why couldn't we just move Windows over to OS/2?

Ballmer: From a user interface standpoint there are two things: look and feel and then the set of applications that you use to interact with the system.

On the look-and-feel side, Windows 2.0 is different from Windows 1.0 because we wanted Windows 2.0 to be the same as the Presentation Manager.

But Apple sued over the Windows 2.0 look and feel. Didn't you change the Presentation Manager in response?

Ballmer: This embodies the same user interface techniques as Windows 2.0.

Have you talked with Apple about whether they believe that the Presentation Manager infringes?

Ballmer: We talk to Apple all the time as a result of [the suit], and Apple's lawyers have told them not to tell us much.

Point 2 is the shell itself. The shell in Presentation Manager is a fairly significant evolution from Windows. Windows had a thing called the DOS Executive that let you copy files, etc. We have made that program quite a bit easier to use and richer in function.

What would we have been able to do if we simply brought Windows over to OS/2?

Ballmer: You would still see some nice applications. I think that that would have been a fine approach.

Hanrahan: Windows is not really multitasking. It is multi-application.

Wouldn't it be able to take advantage of the multitasking engine of OS/2?

Hanrahan: If you just ported it, no.

Ballmer: Now, you could think of a simple port of Windows where it just sort of sits there as its own funny task, and then all these other OS/2 tasks run in background, or you can really marry it on top of the multitasking, which is what we did.

When we sat down to build a graphical user interface system on top of the OS/2 kernel, we sat down to port Windows. The difference between this and a port of Windows is a lot of extensive and good interaction and learning between us and IBM.

When will we see a 386 version of OS/2?

Ballmer: We will make tool support available in the first half of next year, but there is no public commitment from either Microsoft or IBM on when we are going to ship it.

Is Microsoft planning to support IBM's OS/2 Extended Edition?

Ballmer: Extended Edition is a great way to get communications and database function, but I think there will be plenty of third-party alternatives arriving on the scene. For example, we have the SQL Server.

But what about an official statement of support?

Hanrahan: I am totally in favor of Microsoft prerequing the Extended Edition widely. I heartedly encourage it. [The lack of support] says nothing about a change in the relationship between the two companies.

Those customers that bought the original IBM PC AT had the expectation that an operating system would be released that would exploit its architecture. Now OS/2 has really outgrown that machine. What do you say to those AT customers?

Ballmer: We tested it on the AT. I had developers doing edits on 8-MHz ATs, and they said, "You know, this is pretty good."

> "WHEN WE sat down to build a graphical user interface system on top of the OS/2 kernel, we sat down to port Windows. The difference between this and a port of Windows is a lot of extensive and good interaction and learning between us and IBM."
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> STEVE BALLMER
> MICROSOFT

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See us on page 55

NEW PRODUCTS

Software utilities

A memory management utility developed for DOS 4.0 users is now available from **Bloc Publishing Corp.**

Popdrop is run before loading the shell or any other terminate/stay-resident programs. Requiring approximately 600M bytes, the program reportedly gives users total memory control as well as indicating which programs have been loaded and how much memory remains.

Popdrop costs $49.95.

Bloc Publishing, Suite 765, Executive Tower, 800 S.W. 37th Ave., Coral Gables, Fla. 33134. 800-888-2502.

Development tools

A computer-aided software engineering product that reportedly produces C source code and executable graphics programs directly from graphics specifications has been recently announced by **Syscorp International.**

Microstep is targeted at business system developers to use when generating personal computer applications, the company said.

The mouse-driven program reportedly provides support for .DBF, fixed and delimited ASCII files and includes pop-up windows and context-sensitive Help functions.

According to the vendor, Microstep carries a price tag of $5,000.

Syscorp, Suite 200, 9420 Research Blvd., Austin, Texas 78759. 512-338-0591.

Macintosh products

Personal Training Systems has announced a product for Apple Computer, Inc. Macintosh users who are interested in learning Microsoft Corp.'s Microsoft Works 2.0.

The **Masterworks** series is divided into modules for beginning, intermediate and advanced users.

Each module reportedly consists of a 90-min audiocassette tape, a software disk and a summary card.

According to the vendor, each module is priced at $49.95.

Personal Training Systems, P.O. Box 54240, San Jose, Calif. 95154. 408-559-8635.

Data storage

Racet Computers Ltd. has introduced its PCMS line of standalone mass-storage products for IBM Personal Computers and compatible systems, as well as Apple Computer, Inc. Macintosh computer environments.

The **SA** series reportedly includes both internal and external drives formatted in 152M-, 338M- and 638M-byte capacities.

It also offers conventional and helical-scan tape-drive backup units in 150M- and 2.3G-byte configurations and write-once read-many drives with 800M-byte capacity.

According to the vendor, prices start at $1,595.

Racet, 3150 E. Birch St., Brea, Calif. 92621. 714-579-1725.

Advanced Logic's *80386SX-based microcomputer*

Systems

Advanced Logic Research, Inc. has released a microcomputer based on the Intel Corp. 80386SX processor.

The **VIP SX386** reportedly includes an 82385 cache controller with 16K-byte, 35-nsec cache memory. The product is said to measure 4½- by 15- by 17-in.

The standard model reportedly features 512K bytes of expandable random-access memory and a 1.44M-byte 3½-in. floppy disk drive along with five IBM Personal Computer AT-compatible slots.

According to the vendor, the VIP SX386 will ship sometime this month.

The product will be priced in the range of $2,395 to $3,695, depending on which system configuration the user chooses, the vendor said.

Advanced Logic Research, 9401 Jeronimo, Irvine, Calif. 92718. 714-581-6770.

Software applications packages

Scherrer Resources, Inc. has introduced **Mate**, an add-on module to its existing line of sales and prospecting software products.

The product reportedly offers the user a means for recording appointments, as well as facilities for time-logging and expense-reporting functions. Expenses such as auto, travel and lodging may be allocated according to job account numbers. The package is targeted at the insurance, brokerage, real estate and retail trade industries and is available in both 3½- and 5¼-in. disks.

Mate costs $95.

Scherrer Resources, 8100 Cherokee St., Philadelphia, Pa. 19118. 215-242-8581.

Orbit Enterprises, Inc. has released a forms compiler developed for the Hewlett-Packard Co. Laserjet Plus and Series II printers.

Formset 2.0 allows users to design and print typeset-quality forms consisting of lines and boxes of any size. An IBM Personal Computer or compatible with 384K bytes of memory and a floppy disk are required, and a hard disk is recommended.

Formset 2.0 costs $189.95. Orbit Enterprises, P.O. Box 2875, Glen Ellyn, Ill. 60138. 312-469-3405.

Media Cybernetics, Inc. has released **Image-Pro Color**, an image-processing software package that runs on a micro platform to provide users with a tool for 24-bit color and multispectral imaging, the company said.

The product runs on Intel Corp. 80286- and 80386-based machines and reportedly offers file, filtering, analysis and automatic enhancement capabilities.

The program uses a proprietary file format based on the industry-standard Tag Image File Format and supports a variety of I/O devices.

Image-Pro Color costs $2,500.

Media Cybernetics, 8484 Georgia Ave., Silver Spring, Md. 20910. 301-495-3305.

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(407) 626-4818

Map Systems, Inc. is shipping **Release 1.1** of its **Lines, Boxes, Etc.** program.

The product is an extended ASCII and special character set program for IBM Personal Computers and compatibles and dot matrix printers.

Versions are now available for both 24- and 9-pin printers, and support for color printers is offered within both formats.

The memory resident reportedly accepts input from any source and translates lower (1-31) and extended (128-254) ASCII into the appropriate IBM character-set symbol.

According to the vendor, Lines, Boxes, Etc. 1.1 costs $49.95.

Map Systems, Suite 320, 1120 Nasa Road, Houston, Texas 77058. 713-333-9640.

A printing package that reportedly produces 1,000 simultaneous colors on a Hewlett-Packard Co. Paintjet color printer has been announced by **General Parametrics, Corp.**

Called **Printmaker**, the software package includes full-color on-screen preview and automatic kerning capabilities.

The product also supports the Calcomp Plotmaster thermal-color printer, as well as the HP Laserjet II and the HP Laserjet Plus.

Printmaker is priced from $295 to $392, depending on configuration.

General Parametrics Corp., 1250 Ninth St., Berkeley, Calif. 94710. 415-524-3950.

Marcar Personal Computing, Inc. has announced **Version 2.1** of the **Eighty/20 Client Information Management System.**

The software reportedly enables users to analyze and cross-reference a multicustomer database, as well as manage time and activity schedules.

The product will convert appointment data into a visual calendar with a choice of day or month schedules and will allow customer analysis based on up to 16 different criteria.

Additional features are said to include contact name search and printer selection functions, and a word processor is built into the system. Add-on modules are available for expense reporting, price tracking and time billing.

Eighty/20 will run on any IBM Personal Computer or compatible desktop or laptop computer and costs $495.

Marcar Personal Computing, 1107 Hazeltine Blvd., Chaska, Minn. 55318. 800-635-8020.

A software program designed to support marketing and new development processes within an organization has been announced by **K&A Software.**

New Products Diagnostic Audit includes an evaluation of a company's historical new product performance, an analysis of strengths and weaknesses relative to the competitive market and a determination of problem areas.

For use on IBM Personal Computers and compatible machines, the software requires a minimum 256K bytes of random-access memory and IBM's Color Graphics Adapter, Enhanced Graphics Adapter and Video Graphics Array, AT&T's PC3270 or Hercules Computer Technology, Inc.'s display adapter.

The New Products Diagnostic Audit costs $99.95.

K&A Software, Suite 401, Chicago, Ill. 60611. 312-642-2758.

Media Cybernetics, Inc. has upgraded its desktop publishing software, **Halo DPE.**

Version 1.3 has been enhanced to address the needs of those who use the product as a scanning and graphics complement to Xerox Corp.'s Ventura Publisher and Aldus Corp.'s Pagemaker programs.

According to the vendor, the users can take advantage of improved drawing speeds. On-line Help facilities are also included.

Current users may upgrade to Halo DPE 1.3 for $50, according to the company.

Media Cybernetics, 8484 Georgia Ave., Silver Spring, Md. 20910. 800-992-4256.

A series of application accounting software modules for Intel Corp. 80286- and 80386-based machines has been announced by **State of the Art, Inc.**

Called **Mas 90 Evolution/2**, the software reportedly features menu bars, pull windows and a comprehensive report writer.

Modules include general ledger, accounts payable, accounts receivable, payroll, inventory management, sales order processing and purchase order processing.

The product is available to run in either single-user DOS environments or DOS network environments, and The Santa Cruz Operation Xenix version of the software can also be provided.

Modules range from $195 to $995.

State of the Art, 3545 Howard Way, Costa Mesa, Calif. 92626. 714-850-0111.

Dataflight Software, Inc. has begun shipping an enhanced version of its full-text search and retrieval database software.

The **Concordance Information Retrieval System, Version 4.0** reportedly contains 20 functions not offered in the previous release, including text import and expanded sorting capabilities.

A free upgrade is available for those who licensed the package after July 1, 1988, according to the vendor.

Dataflight Software, Suite 68, 10573 W. Pico Blvd., Los Angeles, Calif. 90064. 213-785-0623.

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(503) 635-1301

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Advanced Network Products
(215) 572-0111

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(215) 630-9040

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An engineering project management program is now available from **Engineering Software Co.**

Called **Planmaster**, the software was designed to run on personal computers and is aimed at operational planning professionals.

The product can reportedly implement both the Critical Path Methods and Pert approaches and will provide visual presentations that allow the user to view the project's status. Pop-up menus, pull-down screens and Help facilities are included.

The product also forecasts completion dates and provides warnings on slippages, the vendor said.

According to the vendor, Planmaster costs $395.

Engineering Software, No. 760, 10670 N. Central Expwy., Dallas, Texas 75231. 214-361-2431.

The Voice Connection has introduced an enhancement product for users of Autodesk, Inc.'s Autocad Version 2.6 package.

Called **Voicecad**, the product reportedly allows users to create Autocad drawings using voice commands in place of selecting screen-menu commands or utilizing keyboard entry.

The product incorporates the company's Introvoice IV5 board, a microphone headset and a Voicecad software disk. The system is trained to recognize the user's voice and is said to provide 98% recognition accuracy.

An IBM Personal Computer XT or PC AT with a minimum 640K bytes of random-access memory is required.

Voicecad costs $865, according to the vendor.

The Voice Connection, Suite C, 17835 Skypark Circle, Irvine, Calif. 92714. 714-261-2366.

Micrografx, Inc. has added four new **Clip Art** libraries to its existing series of object-oriented clip art for windows environments.

The four additions are Anatomy, Sports and Recreation, Business Forms and Headline Typefaces IV.

Pricing starts at $79.95, and special bundled editions are available for targeted markets.

Micrografx, 1820 N. Greenville Ave., Richardson, Texas 75081. 800-272-3729.

A credit-checking software package that runs on IBM Personal Computer XTs, PC AT's or compatible systems has been announced by **Leford Software**.

Called **Scoring Credit**, the product reportedly creates a score based on data derived from credit application forms. If the score meets the user's criteria, the program will then automatically request and score applicant credit histories from the appropriate credit bureaus.

According the the vendor, the program can be customized to automatically generate both rejection and acceptance letters.

Scoring Credit costs $1,200.

Leford Software, Suite C, 612 Hampton Drive, Venice, Calif. 90291. 213-399-5511.

Galactic Industries Corp. has announced a spectral search option for its Spectra Calc laboratory data-analysis software system for IBM Personal Computers and compatible computers.

The **Spectra Calc Search** option reportedly provides instant access to Search, Archive and Reporting capabilities from the main Spectra Calc menu.

The product supports the industry-standard Sadtler digital libraries, as well as user-created spectral libraries containing spectroscopy or chromotography data.

The Spectra Calc Search option costs $495.

Galactic Industries, 395 Main St., Salem, N.H. 03079. 603-898-7600.

Intex Solutions, Inc. has upgraded **XYZ:Model**, a companion product available for users of Lotus Development Corp.'s 1-2-3 or Symphony spreadsheet packages.

Version 1.4 incorporates several new functions, including an edition feature designed to help the user avoid errors when remodeling equations.

The software correctly evaluates financial and statistical functions inside its modeling language and translates all other functions as well, the vendor said. The product works directly off data contained in the user's spreadsheet.

According to the vendor, XYZ:Model 1.4 costs $5 to cover the shipping charge.

Index Solutions, 161 Highland Ave., Needham, Mass. 02194. 617-449-6222.

A time manager and desktop organizer package for Microsoft Corp. MS-DOS machines has been announced by **Pyramid Software Publishing, Inc.**

Called **It's About Time**, the software combines a multilevel directory, calendar, diary word processor and mail-merge function.

Other capabilities reportedly include

"Suppose you need to send sales information to 100 people in 100 locations all over the world. You want to do it fast and all at once and you're the only one with a computer.

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—Mary Ann Evans, AT&T Branch Systems Manager

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It's About Time costs $59.95.

Pyramid Software Publishing, Suite A3, No. 105, 25422 Trabuco Road, El Toro, Calif. 92630. 714-583-1060.

Cyco International has announced a software package that allows Autodesk, Inc.'s Autocad users to view and manage .DWG files.

Using **Automanager**, personal computer users can delete, rename and copy individual or groups of drawing files. The product reportedly offers support for IBM Enhanced Graphics Adapter, Video Graphics Array and Hercules Computer Technology, Inc. products.

According to the vendor, Automanager costs $199.

Cyco International, 1908 Cliff Valley Way, Atlanta, Ga. 30329. 404-634-3302.

Research Development Systems, Inc. has introduced **Lettermaster 4.0**, a mailing management software package for IBM Personal Computers and compatible systems.

The product reportedly creates custom mailing lists from an existing database and costs $189 for a single-user version. A networked version costs $495.

Research Development Systems, P.O. Box 110216, Arlington, Texas 76007. 800-338-9181.

Pro Plus Software, Inc. has released **Version 3.0** of **Wall Street Investor**, an investment management and analysis software package for Apple Computer, Inc. Macintosh computers.

The latest release includes multi-account management capabilities, point and figure charts and new trend studies.

In addition, the company has signed a joint marketing agreement with Fidelity Brokerage Services, Inc., which permits users of Wall Street Investor to buy and sell stock and other securities via Fidelity's Investors Express on-line brokerage service.

According to the vendor, Wall Street Investor 3.0 costs $695.

Pro Plus Software, 2150 E. Brown Road, Mesa, Ariz. 85203. 602-461-3296.

A pop-up spreadsheet that offers compatibility with Lotus Development Corp.'s 1-2-3 is now available from **Mindscape, Inc.**

Called **Numbers Up**, the program provides quick calculations and can access Lotus-compatible data, the vendor said.

It also allows users to cut, copy and paste between any two programs.

A minimum of 256K bytes of random-access memory and IBM PC-DOS 2.1 or higher are required for operation.

According to the vendor, Numbers Up costs $79.95.

Mindscape, 3444 Dundee Road, Northbrook, Ill. 60062. 312-480-7667.

Frontline Systems, Inc. has announced an add-in program for Lotus Development Corp.'s 1-2-3 Release 2.0.

Using **3-2-1 Gosub**, the user can create subprograms consisting of a sequence of 1-2-3 formulas or statements in a column on a spreadsheet, the vendor said. The package is priced at $99.95.

Frontline Systems, P.O. Box 7408, San Francisco, Calif. 94120. 800-451-0303.

Scitor Corp. has begun shipping **Project Scheduler 4**, the company's graphics-based project management software package for IBM Personal Computers and compatibles.

Several features have been added, the vendor said, including an extended graphical interface based on IBM's Systems Application Architecture guidelines. On-line documentation is also included.

Project Scheduler 4 costs $685.

Scitor, 250 Lincoln Center Drive, Foster City, Calif. 94404. 415-570-7700.

Two employment systems designed specifically for corporate human resources departments are now available from **Microtrac Systems, Inc.**

According to the vendor, **Restrac Mastertemp** is a database management system tailored exclusively for in-house temporary employment services. The **Restrac Employee Skill Inventory** package will match current, qualified employees with job openings within the company.

The programs run on IBM Personal Computers, Personal System/2s and compatible systems. The base price for the systems is $4,995.

Microtrac Systems, 19 Needham St., Newton Highlands, Mass. 02161. 617-965-4660.

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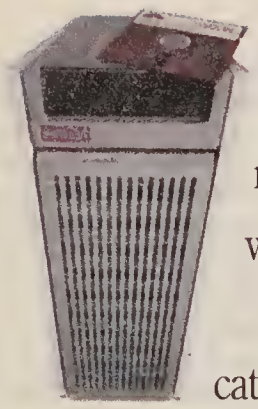

Recently some of our competitors have been using the term transparent to mean just about anything. But at Banyan, we use it to mean something very specific.

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Banyan Systems Inc., 115 Flanders Road, Westboro, MA 01581, (508) 898-2404.

DATA STREAM

Patricia Keefe

Whoa, Nelly!

First things first, fellas.

Last week, Apple cheerfully spilled the beans to one of our sister publications that a 16M bit/sec. token-ring card was in the works. Wow.

I have to admit I was more amazed than impressed by this revelation. My initial reaction went a little something like this: Excuse me, but aren't we getting a bit ahead of ourselves here?

You see, this speed demon is slated to follow the seemingly reluctant release of Apple's extremely vaporous 4M bit/sec. token-ring card, which, incidentally, is now set for delivery in the first half of 1989.

The ship date for this adapter is quite the moving target, in case you haven't noticed. The last we heard from Apple, the 4M bit/sec. card was to have shipped in January. Before that, Apple was telling the press at the Localnet show to pencil in a November announcement.

Lest Apple venture to vehemently deny ever announcing a 4M bit/sec. card, please note that it has never been shy about answering questions and pro-

Continued on page 63

This joint is really jumping

Comdex/Fall '88 acts as a catalyst for networking standards activity

BY PATRICIA KEEFE
CW STAFF

The ever-simmering caldron of networking standards activity is on the verge of bubbling over. In the last month, at least four groups have come forward with standards proposals:

• About 13 suppliers of network-related products met at Comdex/Fall '88 to organize efforts to define an X.400 Application Programming Interface (API), which will provide a common interface for access to X.400 for applications developers.

• The CCITT TR30.23 body for establishing standards for facsimile DCE interfaces met at Comdex to discuss facsimile error correction. The next meeting is slated for Jan. 19-20 in San Antonio, Texas.

• The IEEE 802.5 Committee accepted a proposal that determines the signaling mechanism for 4M and 16M bit/sec. fiber-optic token-ring networks.

• Ethernet also jumps on the fiber-optic bandwagon with a 62-0 vote by the IEEE 802.3 Committee, which established the 10Base-F Task Force to standardize two approaches — active and passive stars — and a cabling plant.

The token-ring fiber-optic proposal is a compromise between schemes suggested by Proteon, Inc. and Siecor Corp., according to Alan Marshall, a cofounder and vice-president of Proteon. The two submitted a proposal along with IBM, Codenoll Technology Corp. and Ericsson Information Systems.

IBM does not have a proposed approach but is supporting the compromise technology, which essentially determines the signaling approach that will enable information to be passed from the workstation to the fiber-wire center. The committee now must write a specification.

Marshall also said the lower speed fiber token-ring will not compete with 100M bit/sec. Fiber Distributed Data Interface.

In a somewhat unusual move, the 10Base-F Task Force will consist of three sections: passive star, active star and media (cabling plant).

A group of 36 companies, led by Frederick W. Scholl, a cofounder of Yonkers, N.Y.-based Codenoll Technology, is developing the passive star proposal, while Charles Marsh at Siecor heads up a team of mostly computer electronics vendors writing the active star document.

Continued on page 60

Carriers to rev up for faster ISDN

BY ELISABETH HORWITT
CW STAFF

Even as carriers finally begin to deploy Integrated Services Digital Network (ISDN) services, they are gearing up for a faster version of the standard that could boost maximum ISDN networking speeds from 1M bit/sec. to as high as 150M or even 500M bit/sec.

The need to boost ISDN networking speeds will grow with the advent of faster workstations, more graphics-based applications and higher speed local-area networks, industry sources said.

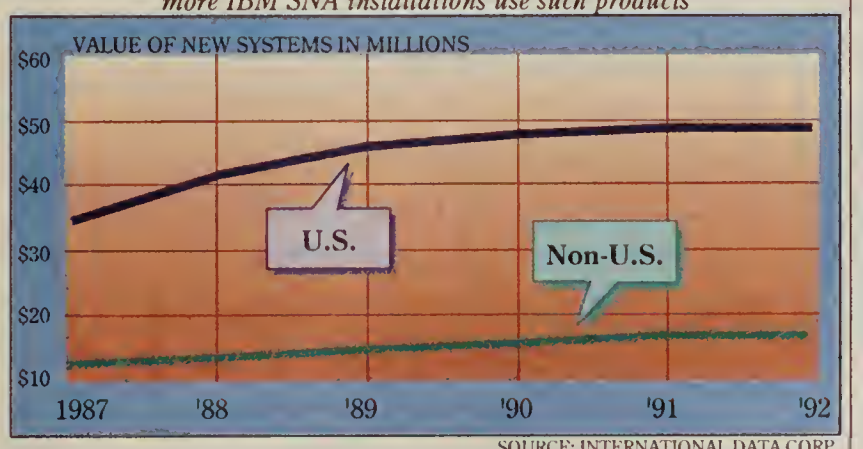
However, actual deployment

Continued on page 65

Data View

A packet-switching market projection

Slow sales for new systems should pick up in the next few years as more IBM SNA installations use such products



SOURCE: INTERNATIONAL DATA CORP.
CW CHART

How close is close enough?

BY PATRICIA KEEFE
CW STAFF

Will they or won't they? That has long been the question concerning interoperability of Microsoft Corp.'s OS/2 LAN Manager and IBM's OS/2 LAN Server, two key OS/2 file servers.

It is now clear that some level of interoperability exists. So the question appears to have become a matter of how close is close enough.

The two products are not identical, but they apparently share enough points in common so that fears that OS/2 Standard Edition developers will have to choose between one of the two

Continued on page 66

Inside

• Novell takes a walk on the WAN side. Page 61.
• Study says EDI software is growing at a steady pace. Page 63.
• Unisys boosts DCP/30 processor. Page 67.

Car wars fought from behind VSAT dishes

BY MARK BREIBART
CW STAFF

A new kind of Star Wars seems to have opened up among U.S. automakers, which are using satellite communications to provide their dealers with up-to-date customer records, as well as information about the latest service offerings, pricing changes and other key data.

Chrysler Corp. recently deployed very small-aperture terminal (VSAT) dishes from Hughes Aircraft Co. [CW, Sept. 10] in a satellite network that links to its dealers. Now Toyota Motor Corp. is doing the same thing, hoping to gain a competitive edge in its efforts to break into the luxury car market.

Its new Lexus LS400 sedan, priced in the $30,000 to $35,000 range, was designed to compete with cars from Mercedes-Benz, BMW and Volvo.

Through the system's integrated data and video capabilities, the Japanese automaker will be able to offer customers and dealers services not found in most of the auto industry.

The network will allow all information about a customer's car, including its complete maintenance history, to be on-line and accessible from any Toyota Lexus dealership. Throughout the industry, customer records have traditionally been available only from the seller, said Robert Best, group vice-president of Toyota's Systems and Business Division. Toyota hopes that its national database will give it a slight edge.

Other advantages to the customer are less direct. Toyota plans to keep its dealers up to date through the video facilities. Messages from top management, technical service information and parts announcements will be broadcast live, Best said. Also available over the network will be inventory information for both cars and parts.

For car makers, improving customer service has become "a major, major drive," said Donald Keithley, a partner at JD Power & Associates, a marketing information firm. "World-class service is one way a manufacturer can differentiate itself," the Agoura Hills, Calif., analyst said.

In its quest to standardize service at a high level, Toyota is pinning much of its hopes on the network. Keithley called it "the emerging technology for automakers." Chrysler, in fact, recently announced plans for a similar, if larger, satellite setup.

The communications system will link together the new Lexus dealers, Toyota's main offices in

Continued on page 61

A Hughes technician *tinkers with an auxiliary electronics unit attached to a VSAT dish*

BIT BLAST

DEC to resell Vitalink bridges

Digital Equipment Corp. has signed an agreement to resell and support **Vitalink Communications Corp.'s** Translan III and IV local-area network bridges as part of its own networking product line, according to the companies.

The bridges, which DEC has marketed since 1984, connect Ethernet LANs across a remote link at speeds up to 1M bit/sec. Vitalink also markets token-ring bridges, but DEC has no immediate plans to market or resell those products, a spokesman said.

US West Advanced Technologies, Inc.'s (ATI) research and development subsidiary has granted **ISDN Technologies Corp.** a nonexclusive license to market and sublicense ATI's Integrated Services Digital Network (ISDN) Switch Simulator software.

That technology enables a Digital Equipment Corp. Microvax to emulate both the AT&T 5ESS and the Northern Telecom, Inc. DMS-100 ISDN central office switches.

Unisys Corp. has agreed to jointly market electronic data interchange (EDI) software with **EDI, Inc.**

The software vendor sells Telink, IBM Personal Computer software that reportedly provides document exchange between different systems via the EDI ANSI X.12 standard.

Edward D. Jones & Co. has awarded a four-year, $30 million contract for a comprehensive satellite communications network to **Hughes Network Systems**, a subsidiary of Hughes Aircraft Co.

The system will be used to transmit interactive data and video communications and to enhance the speed of financial transactions. The implementation calls for a network hub located at the user's headquarters outside of St. Louis and up to 2,000 remote terminals installed at Jones' facilities nationwide.

Hughes Network Systems also garnered a contract with **General Electric Information Services** (GEIS), this one estimated at $8 million over five years.

The pact calls for Hughes to install its very small-aperture terminals, or VSAT, using its personal Earth stations in the company's nationwide data communications network.

The completed system is expected to lower GEIS' operating costs by replacing selected telephone circuits with satellite links, supporting higher bandwidth requirements and improving network performance.

Dynamic Microprocessor Associates, Inc. (DMA) said it will allow **Novell, Inc.** to resell two DMA products for use with Novell's Netware Asynchronous Communication Server (NACS). DMA's PCanywhere III will enable NACS users to remotely access workstations anywhere on the network.

It will also reportedly reduce the number of modems required. DMA's Ascom IV will provide terminal emulation and file-transfer capabilities between NACS users and hosts supporting asynchronous dial-in.

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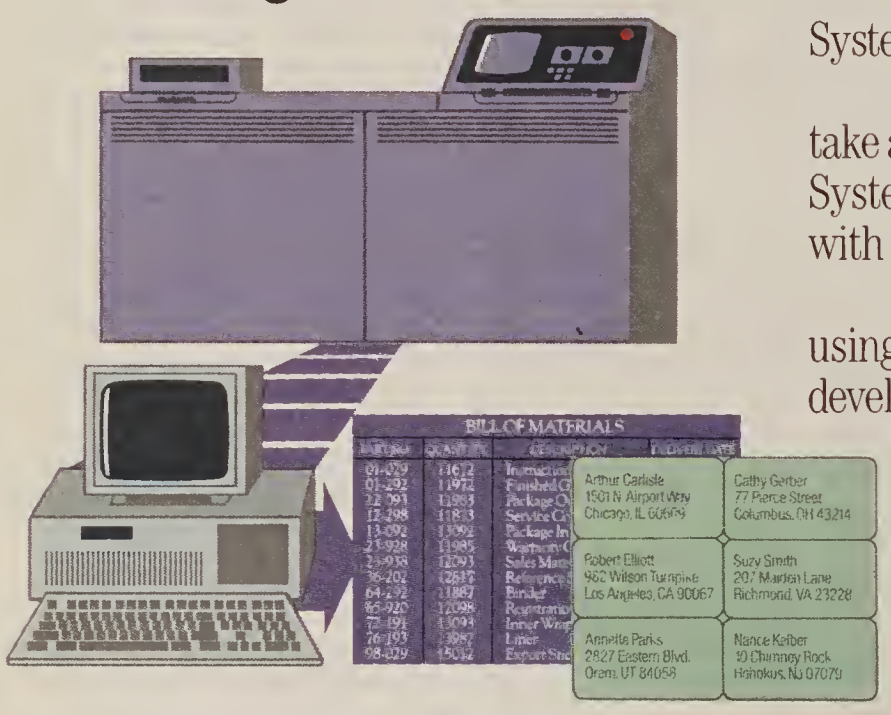

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Really jumping

CONTINUED FROM PAGE 59

The major difference between the two approaches is that the passive star approach has no electronic or active devices and no central point of failure. According to Mike Coden, president of Codenoll Technology, it is also cheaper and more reliable. "An active star network tends to cost a minimum of three times more," he claimed. Codenoll makes both passive and active networks.

It also cannot provide collision detection, according to Menachem Abraham, vice-president of engineering at Chipcom Co. He suggested the passive approach is particularly suited for specialized applications, such as when a network is in an industrial environment that precludes an active device that has power.

In an active star, system signals are distributed to other devices on the network via an electronic hub. Abraham said the active approach works better on a larger network, in which the signal has to travel greater distances.

Synoptics Communications, Inc. also claimed that an active star provides greater data integrity and is much cheaper. Obviously, there is much disagreement between the two camps.

The publicity-shy X.400 group's Comdex meeting in Las Vegas followed an initial meeting held at last month's Electronic Mail Association's Conference in Boston. Another session will be held this month, according to David Knight, a marketing manager at Retix Corp.

Group co-sponsor Retix submitted its X.400 API as the model for the common API. A subcommittee is expected to settle the specification within 90 days. Following committee approval, the draft API is expected to be submitted to an industry standard-making body.

The group is considering hiring an independent consultant to advise and coordinate its activities but failed to come to an agreement at Comdex. The goal behind the API is to allow users to transparently exchange messages across a mix of electronic mail systems.

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Novell unveils gateways

BY PATRICIA KEEFE
CW STAFF

PROVO, Utah — In a move that punches up its CXI, Inc. subsidiary gateway offerings, Novell, Inc. recently unwrapped two Netware-compatible gateways — Netware Systems Network Architecture (SNA) Gateway and Netware SNA Gateway Entry Level System.

The gateways launch a new phase in Novell's strategy, which entails a shift in focus to enterprisewide networking.

This, in turn, has prompted an expansion of the Communications Product Division (CPD), formerly CXI, which has, in the last six months, doubled the number of employees from 45 to 90 and moved into a larger facility.

CPD will concentrate on remote personal computer access to local-area networks, LAN-to-LAN bridging, asynchronous communications services and CCITT X.25 gateways and bridges. In particular, the division will work to integrate these technologies with Netware.

Since its purchase by Novell in 1987, CXI and its products have kept a low profile. At least one analyst maintains that CXI's products have been a disappointment to Novell. The new push in gateway technology could signal a turning point.

"With 260,000 Netware systems installed and only 3% of the 300,000 hosts in the industry connected to LANs, we see a huge market potential," said Darrell Miller, CPD's vice-president and general manager.

Novell expects to carve out a sizable chunk of that market opportunity by offering gateways that reportedly support more sessions at a lower price than competing products. In addition, integrating these products with Netware is expected to diminish reliability concerns that typically arise from multivendor patchwork solutions.

Netware SNA Gateway is said to allow up to 97 workstations on a LAN to communicate with an IBM or compatible host using one of five connectivity options: IBM's Token-Ring, remote, remote assist — Synchronous Data Link Control (SDLC) up to 56K bit/sec. — coaxial multiplexer and coaxial cable.

Priced at $2,995, features include a Quick-Start Guide, a menu-driven customization program, diagnostic management tools with an internal trace facility, support for Advanced and SFT Netware 2.1 and a self-test said to isolate LAN problems between the gateway and the workstations.

A subset, the ELS version provides the same features under two connectivity options: remote — SDLC up to 19.2K bit/sec. — and coaxial cable. Priced at $595, it supports up to five workstations, or 16 users, with a remote link and is compatible with SFT, Advanced and ELS Netware Level II.

A related offering is the Netware 3270 LAN Workstation, which reportedly provides terminal emulation for any PC on the LAN and talks to the host via a Novell SPX or IBM Netbios connection to either of the Netware SNA gateways. Users can purchase the workstation software separately for $995 or bundled free with a server-based license for SFT Netware Version 2.1.

Novell also announced the following products and agreements:

- Full Netware client and server support for IBM's 16M-bit Token-Ring adapters. Drivers for the adapters will be available in the first quarter of 1989.
- Two Apple Computer, Inc. Macintosh Ethernet network adapters — the 16-bit NAE1000 for the Macintosh SE and the 32-bit NAE2000 for the Mac II, which will cost $495 and $595, respectively. Available in the first quarter, both cards are Netware- and Apple Ethertalk-compatible.
- A system reliability report commissioned from ITT Research, Inc. in Rome, N.Y., and a related risk analysis package co-developed by both firms.
- A technology transfer and co-marketing pact that allows Storage Dimensions, Inc. to manufacture and co-label the Novell-designed NDS2 and NDS4 disk subsystems. Novell will assist Storage Dimensions in the designing, testing and marketing of other undisclosed mass storage products that adhere to Novell standards.
- A nonexclusive development and marketing agreement with Wordtech Systems, Inc. that will bring Ashton-Tate Corp. Dbase language support to Netware SQL, Novell's open interface relational database engine. Wordtech will develop and market Netware SQL versions of its DBXL and Quicksilver products. This will provide Netware users with a server-based Dbase language programming and execution environment.

Car wars

FROM PAGE 59

Torrance, Calif., and regional offices. The core of the network will be a hub satellite station and video broadcasting studio at company headquarters. Each dealer will have a small satellite dish, dubbed VSAT.

The network equipment, including the satellite, is supplied by Hughes Network Systems in Germantown, Md. An IBM Application System/400 will handle the local computing at each network node. The dealers' applications will be written in-house.

Overseas transmission

One place the network will not go, at least not directly, is to the manufacturing plants in Japan. Dealers will have to transmit their new car orders to headquarters, which will send them across the Pacific via another satellite network.

Each night, the status of the orders will be updated from Japan into the Torrance database.

The satellite network could help keep costs down. For just data transmission, Best said, it is cheaper than leased lines. "Add the video as an additional capability, and the choice was easy," he added.

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EDI software revenue climbing 25% yearly

BY PATRICIA KEEFE
CW STAFF

MOUNTAIN VIEW, Calif. — The market for electronic data interchange (EDI) software is excellent, growing at an annual average rate of 25% when the commercial and federal government segments are combined, a recent report said.

By 1993, revenue from these markets will escalate to $141 million, up from $29 million in 1987, according to "EDI Software Products," which is published by Input.

Input defines EDI software at minimum as a translator that converts data between internally used formats and commonly agreed-upon formats. Increasingly, these formats are publicly approved ones such as X.12.

Two characteristics of the EDI software market are its relatively small size and its fragmentation. Given the market's early stage, there are as yet no clear market leaders, so risks exist for users to purchase the wrong product, which may later be abandoned, Input warned.

But it also provides vendors with opportunities such as development of utilities and tools that enable users to audit and manage the EDI process better, as well as software specific to the Apple Computer, Inc. environment.

EDI optimization

To fully optimize EDI's benefits, EDI software and its related corporate applications must be tightly integrated, the report said.

But until recently, the EDI software market consisted mostly of small independent firms, EDI network service providers selling their own or other vendors' packages, smaller applications software vendors that added EDI functionality to their existing software and distributors.

Now, several major software companies, including McCormack & Dodge Corp., Pansophic Systems, Inc. and ASK Computer Systems, Inc., are taking EDI positions, typically through alliances. Yet another developer, Management Science America, Inc., has licensed and enhanced another vendor's package for integration with its management and manufacturing applications.

These vendors may be united in their interest, but many diverge when it comes to strategy, the report noted. For example, third-party network services providers McDonnell Douglas and Western Union Corp. no longer sell EDI software. Instead, they now certify other vendors' products for use on their private networks.

However, the market's leading network provider, GE Information Services, a division of General Electric Co., and Sterling Software, Inc., offers its own EDI software. GE Information Services has also struck multiple "EDI Agent" agreements with specialized software firms that receive revenue from traffic they bring to the network.

Keefe

FROM PAGE 59

viding details about this officially unannounced product. That goes for the recently introduced Transmission Control Protocol/Internet Protocol drivers it got from Ungermann-Bass.

While we're on the subject, this nonsense about formal vs. unofficial product announcements is just that. For example, Novell claims to have first announced its awkwardly named Netware for Macintosh in June 1988. Say again? I can remember discussing and writing about this project back in late 1986. So in my view, Netware for the Mac is a heck of a lot later than the six-month lead time that Novell *formally* announced. Hey, once you start briefing the press, analysts and selected users, consider the cat out of the bag.

Anyhow, back to the future. An Apple product manager reportedly noted that at the moment, there isn't much demand for a 16M bit/sec. token-ring. Maybe so, but at the rate the 4M bit/sec. card seems to be progressing, I figure 16M bit/sec. speed will be all the rage by the time any Apple token-ring offering sees the light of day.

The manager then added that we'll see a 16M bit/sec. card from Apple as soon as the market asks for it.

Don't hold your breath.

Considering the number of existing and would-be Fortune 1,000 users who have been begging for months — a year even — for token-ring connectivity to legitimize their Macs, market demand seems to have little impact on Apple ship dates. But maybe that's about to change.

No fooling

A second Apple exec reportedly suggested that Apple's lack of a token-ring card is now starting to be a problem.

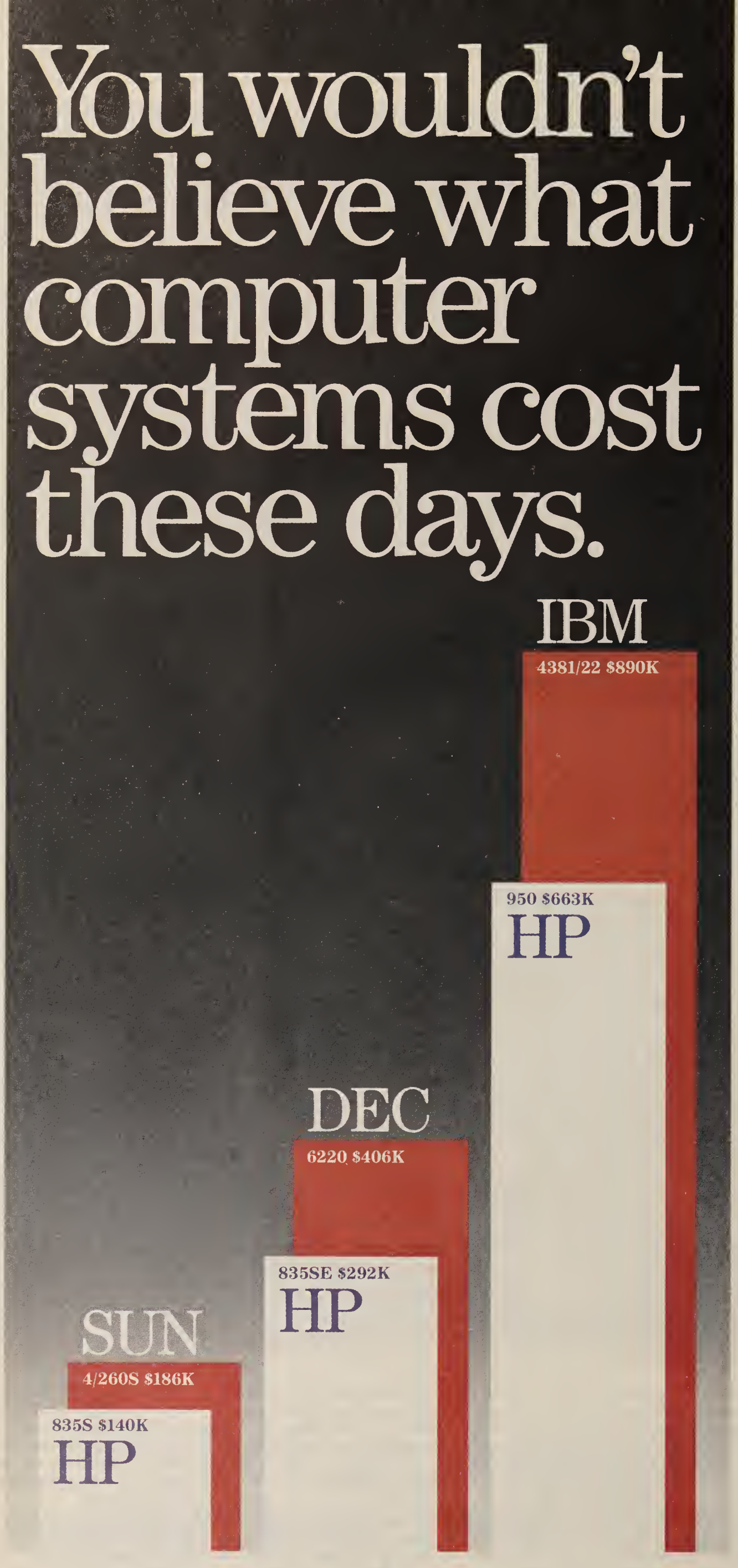
Wrong again. It's been a problem all along. It's just that Apple, which claims to be so in tune with the heartbeat of corporate America, is just beginning to notice this now. How blind can you be?

Oh yeah — Apple continues to talk about its Integrated Services Digital Network and Fiber Distributed Data Interface plans. Well, let me tell you, this stuff is even further down that long dusty road.

Methinks it's time for Apple to talk a little less and deliver a little more, because there's nothing like a little cold, hard reality to persuade the most resistant user and convince the most cynical industry observer.

Keefe is a *Computerworld* senior editor, networking.

You wouldn't believe what computer systems cost these days.



Note: The cost-of-ownership figures reflect the initial purchase price and 5-year hardware and software support costs for servers configured with operating systems, memory, mass storage and terminal connections. Prices as of October 1, 1988.

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Faster ISDN

FROM PAGE 59

of broadband ISDN will depend on the regional Bell operating companies' ability to identify applications with a strong initial customer base, according to Thomas Nolle, president of Haddonfield, N.J., market research firm CIMI Corp.

"It's possible that broadband ISDN availability will generate demand for a new class of applications, but that [demand] is not likely to be imminent," Nolle said, pointing out that current 45M bit/sec. T3 services have yet to spark demand for the high-speed applications that such offerings could support.

In order to cost-justify initial deployment of switching hardware and fiber-optic cable over the local loop — both expensive items — local carriers need an initial application that will quickly generate revenue, Nolle said.

Several regional Bell operating companies are considering whether they can initially justify deployment of broadband ISDN as a delivery mechanism for cable television, he added. Once the facilities are in place, there still will be plenty of available bandwidth for various business applications, he said.

Last August, for example, Southwestern Bell Corp. used fiber-optic links to deliver a telecast of a St. Louis Cardinals-Philadelphia Phillies game played at Busch Stadium in St. Louis, according to spokesman William Motchan. "The purpose of the trial is to show we could originate and terminate live transmissions of good quality over fiber."

The invitation-only audience included some 500 major business customers, including medical schools, entertainment concerns and video production houses, which were potential customers for the service, Motchan said. Videoconferencing is another potential application the carrier is exploring.

"We have done economic forecasts showing that by 1992, fiber will be as cheap or less costly than copper to install for voice services," Motchan said. "Add broadband data services and you get more than the cost of installation and maintenance."

In search of . . .

Exploring potential broadband applications is a high-priority project for Nynex Corp., a spokesman said. The regional holding company is currently focusing on specific industries, such as advertising, that could use broadband facilities to transmit high-resolution graphics to remote locations, "instead of a messenger bringing it on a bicycle," the spokesman said.

While few ISDN customers have reached beyond initial ISDN applications such as personal computer-to-mainframe links and voice/data integration, MIS managers said they can see the need for more bandwidth in the future.

> "BY 1992, fiber will be as cheap or less costly than copper to install for voice services."
>
> WILLIAM MOTCHAN
> SOUTHWESTERN BELL

Tenneco Co., for example, an early user of Southwestern Bell's ISDN service, is "looking forward to some of the higher speed offerings [for applications] that traditional ISDN speeds can't handle," said John Saccente, the Houston-based holding company's telecommunications director. While current ISDN speeds suffice for much of Tenneco's current networking needs, "there are already situations that are exceptions, such as sending large files, graphics and applications that require instantaneous response," Saccente said. "And there will be more in the future."

The American National Standards Institute's (ANSI) T1.S1 committee has been working on broadband ISDN for about two years now and is unlikely to finalize the standard until the early 1990s or later, sources said. The standard is likely to support a range of transmission rates, CIMI's Nolle said, since fiber-optic technology keeps boosting the maximum transmission speeds the medium can support.

Another priority for the ANSI committee is ensuring that broadband ISDN conforms as closely as possible with existing high-speed networking standards, such as Fiber Distributed Data Interface, since this would pave the way for acceptance of the new standards, Nolle said. T1.S1 committee members are also working with IEEE to converge broadband ISDN with 802.6, a 45M bit/sec. metropolitan-area network standard.

In the meantime, Bell Communications Research Corp., or Bellcore, is working with its Bell operating company owners to provide a nondedicated 45M bit/sec. service that would support a variety of high-speed applications, according to John Schantz, district manager of broadband services planning at Bellcore.

The first version of the service will be Switched Multimegabit Data Service, a pipeline between different types of local-area networks, he added. Several Bell operating companies have indicated that they intend to offer the service in the near future, "although putting in the underlying fiber will take significant work," Schantz said. Other services, which could link computer-aided design and manufacturing workstations and other high-speed computers, are also on the Bellcore and Bell operating companies' drawing boards.

Various vendors and organizations have already demonstrated that 45M bit/sec. or higher is technically possible, according to Schantz; the next step will be to move it out of the lab into available products and to get very large-scale integration to bring prices down.

Unisys enhances IBM links

BY ELISABETH HORWITT
CW STAFF

BLUE BELL, Pa. — With the introduction of SNA/Net software, Unisys Corp. has enabled its Distributed Communications Processors (DCP) to handle sessions with multiple Unisys and IBM mainframes without the need for host intervention, the vendor claimed.

IBM is only beginning to offer this capability by providing support of its PU2.1 peer-to-peer networking protocol in the latest version of IBM's Network Control Program and VTAM.

SNA/Net allows a DCP to act as an IBM PU2 device such as a cluster controller but also provides the functions of a PU4 or IBM front-end processor and PU5 or IBM host, Unisys Program Development Manager J. Daniel Gansz said.

DCPs can route sessions among multiple IBM and Unisys 1100 and 2200 hosts; users do not lose their connection to other systems if an IBM host goes down, Gansz said. SNA/Net will establish sessions for Unisys or IBM terminals and IBM Personal Computers in terminal emulation mode, he added. The DCP translates requests for IBM host sessions into a 3270 data stream; requests for Unisys host sessions run in Unisys' Uniscope mode.

IBM's recently shipped VTAM and NCP releases allow PU2.1 devices to communicate with one another and IBM hosts across a Systems Network Architecture backbone of IBM front-end processors with only one initial IBM host intervention. Unisys plans to support PU2.1 in a future SNA/Net release "because it's cheaper than doing the whole PU5 ballgame" on a communications processor, Gansz said. PU5 is particularly unwieldy for smaller DCPs used as network concentrators at remote sites, he added.

As part of its networking strategy, Unisys plans for its DCPs to support the Open Systems Interconnect standard as well as proprietary networking protocols used by the Sperry and Burroughs sides of the company, Gansz said.

How close

CONTINUED FROM PAGE 59

seem exaggerated.

"From what I understand, all the fundamental capabilities of the system that the system depends upon will be common to both [file server] implementations," said Charles S. Hanes, a vice-president of technical consulting at the Santa Clara, Calif.-based Lanquest Group.

There are four important levels of compatibility, according to 3Com Corp., which co-developed LAN Manager: direct data and resource sharing; applications compatibility; common user commands; and common standard network protocols.

In a white paper, 3Com said that its LAN Manager-based 3+Open network operating system and LAN Server share a common command interface for accessing shared resources, can run the same applications without modification, use the same network commands and support similar network standards at all levels of the Open Systems Interconnect model.

In another paper, Microsoft said interoperability is based on use of the same standard interfaces: OS/2 on the server, the Server Message Block protocol, Netbios and NetBEUI/DLC. Microsoft came up with a certification program for LAN Manager OEMs to ensure conformance with LAN Server and each other.

Tiptoeing around

IBM's Comdex/Fall '88 press announcement very carefully excluded any mention of LAN Manager compatibility. However, IBM has noted that LAN Server incorporates LAN Manager. It also demonstrated support at Comdex for the Ashton-Tate/Microsoft SQL Server and file exchanges with LAN Manager.

"The only question was whether IBM would officially support and document [Named Pipes] to support customer use of them," Hanes said, echoing previous comments by IBM officials.

This issue appears to have been resolved. IBM's Lee Reiswieg, who heads OS/2 development efforts in Austin, Texas, told the press at Comdex that IBM's OS/2 Standard Edition 1.1 would support the LAN Manager's Named Pipes application programming interface (API) and applications that use Named Pipes, a Microsoft spokeswoman said.

So the question of whether developers will have to choose sides revolves around the roughly 125 LAN Manager APIs; with the exception of Named Pipes, IBM has remained mum on its support for the bulk of these — hence the uncertainty that continues to cloud the air.

One camp abides by the old saying that close only counts in horseshoes. It maintains that OS/2 developers will have to write separately to LAN Manager and LAN Server. But that does not seem likely, at least for Standard Edition.

It is not clear whether OS/2 applications developers plan to exploit LAN Manager APIs beyond Named Pipes. If most do not — writing to the most common denominators — then there is no issue. But even if some developers do take advantage of some of these, most of the other APIs will be common to the IBM LAN Server with a few minor differences, Hanes said.

"The key question is: Can developers go out and develop applications and do it once for both [file servers]? The answer is yes," he said.

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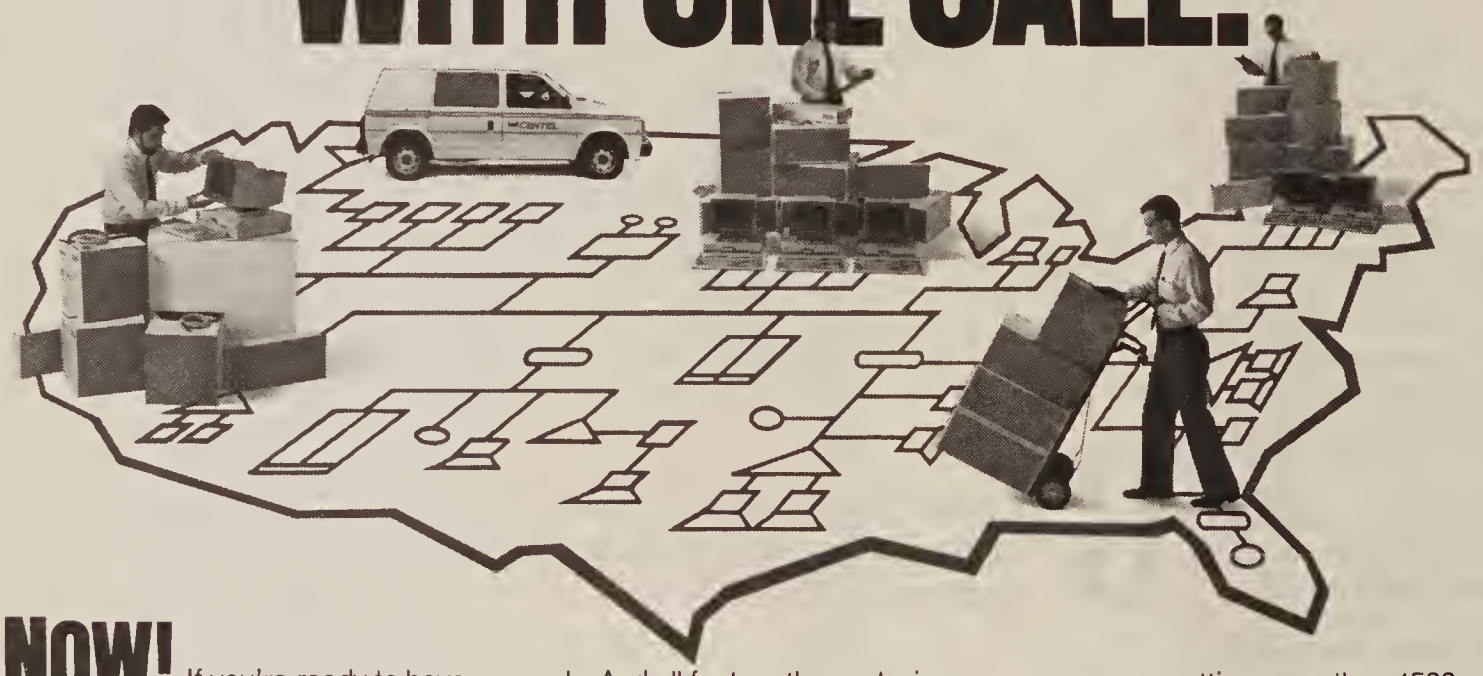

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NEW PRODUCTS

Local-area networking hardware

A communications processor for medium-size networks has been introduced by **Unisys Corp.**

The **DCP/30** reportedly supports a transaction processing rate of up to 45 transaction/sec.

It is capable of performing front-end and nodal processing as well as remote concentration communications and networking functions, the vendor said.

Pricing for the DCP/30 starts at $97,824 for a base system, according to the vendor.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-5367.

A fault-tolerant Ethernet local-area network has been announced by **Alantec.**

Designated **FTEL**, the product consists of a dual-port Ethernet adapter card with fault-tolerant driver software. It is mounted in an IBM Personal Computer AT or compatible computer and includes a dual-cable Ethernet arbitrator that supports up to 30 users, the vendor said.

The FTEL package costs $10,080. Pricing for FTEL adapter cards is $780 in single-unit quantities.

Alantec, 101 Hammond Ave., Fremont, Calif. 94539. 415-770-1050.

Able Computer's *Easyway BI Host Server*

Able Computer, Inc. has introduced a server designed for the Digital Equipment Corp. local-area network market.

The **Easyway BI Host Server** uses twisted-pair wiring for DEC's VAXBI systems and can be configured as a standalone communication subsystem or integrated as an Easyway network component.

The product comes standard with 128 virtual circuits and is expandable to a maximum of 512 virtual circuits.

The Easyway BI Host Server is priced from $18,000.

Able, 2567A S.E. Main St., Irvine, Calif. 92714. 714-553-1188.

Invisible Software, Inc. has announced the **Invisible Ethernet** board, reported to be a complete local-area network that includes the Net/30 operating system as well as all interface hardware.

The 10M bit/sec. board is compatible with the IBM Netbios standard, the IBM PC-LAN program and other Netbios-based programs.

The product is priced at $399 per computer.

Invisible Software, 481 47th Ave., San Francisco, Calif. 94121. 415-221-0916.

Local-area networking software

A local-area network product that allows personal computers to communicate over an Ethernet network with any computer that uses Transmission Control Protocol/Internet Protocol (TCP/IP) communications protocols has been announced by **Locus Computing Corp.**

Called **TCP/IP for DOS**, the product reportedly includes support for most popular Ethernet cards and comes with an Application Programming Interface.

TCP/IP for DOS will cost $295 and is scheduled for delivery in the first quarter of 1989.

Locus Computing, 9800 La Cienega Bivd., Inglewood, Calif. 90301. 213-670-6500.

Server Technology, Inc. has enhanced its local-area network software for IBM Personal Computers and compatible systems.

Easylan 4.0 reportedly increases communications throughput by more than 30% and now includes an on-screen menu interface. The software is priced at $99.95 per disk and utilizes the PC's standard RS-232C serial communications port and telephone cabling to interconnect Microsoft Corp. MS-DOS computers.

Server Technology, 140 Kifer Court, Sunnyvale, Calif. 408-738-8377.

A graphics-based local-area network diagnostic software package has been introduced by **Tiara Computer Systems, Inc.**

The **Tiara LAN Maintenance Program** was desigend to allow network managers to test cabling integrity and network accessibility in Arcnet or Ethernet-based network environments. The product runs on IBM Personal Computers, XTs, ATs, Personal System/2s and compatible systems. It is priced at $495.

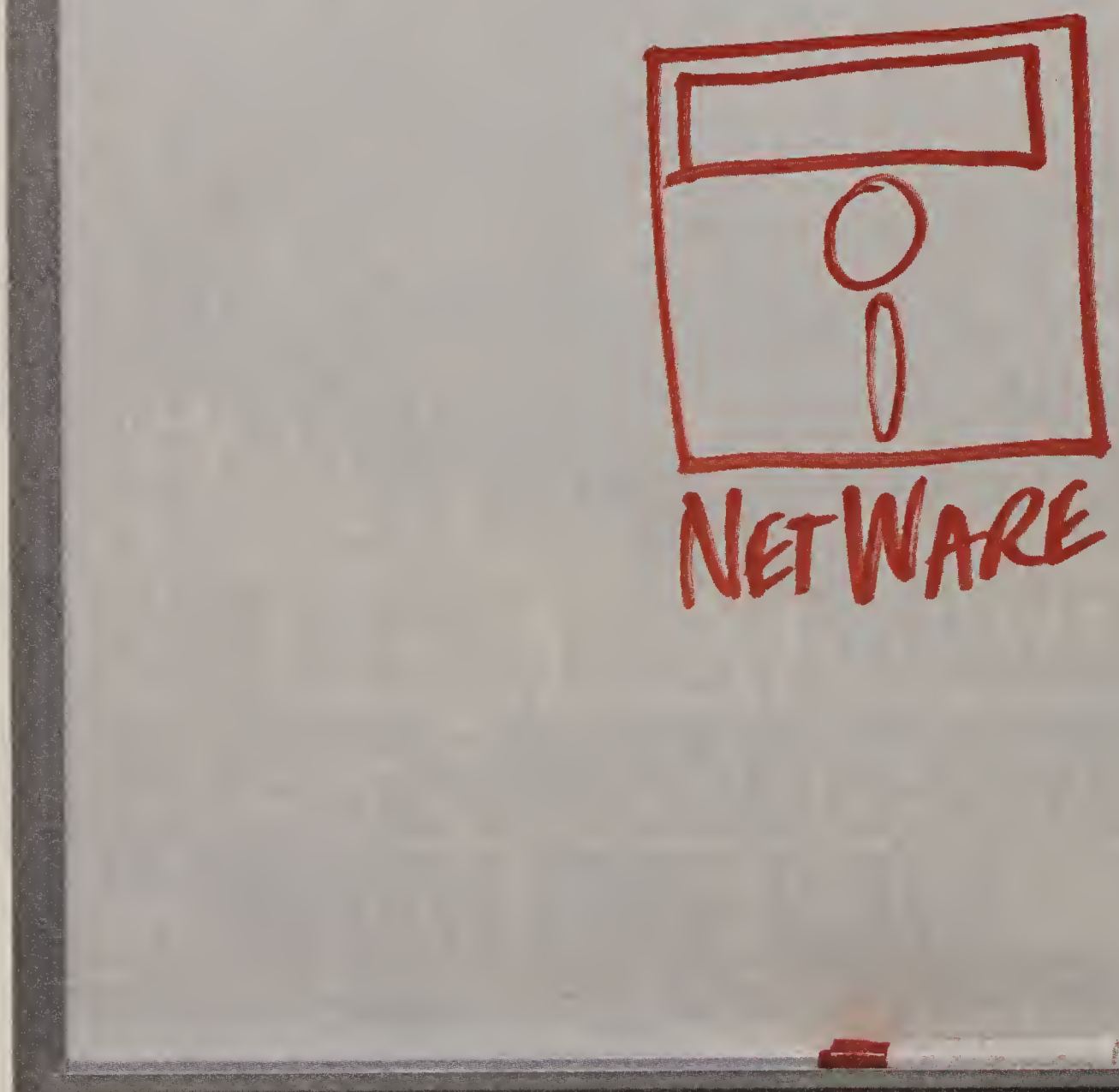
Tiara, 2700 Garcia Ave., Mountain View, Calif. 94043. 415-965-1700.

Network management

A dial-network management system has been introduced by **Concord Data Systems, Inc.**

Called **Netaccess 900**, the system is said to provide a Microsoft Corp. Windows-based control interface and offers real-time monitoring functions. Other features include a front-loading rack capable of accom-

Continued on page 71



Choose this,

Everyone's computing needs are unique. Which is why different people choose different solutions. And why so many diverse computing environments are being used today.

While this variety of solutions makes it easy for users to meet their needs, it presents some problems. Like sharing information between incompatible systems. The kinds of problems facing more and more companies as their information systems grow and diversify.

Novell means freedom. Fortunately, you can solve those problems by making one simple choice: Novell. Novell's NetWare® operating system software supports a myriad of computing environments.

That means you have the freedom to network everything from PCs to Macintosh, VAX to PS/2, 386 to mainframe host systems. So everyone can use the workstations they choose, without changing the way they work.

The power to choose. With NetWare, Novell gives you the most powerful combination of network performance, security,

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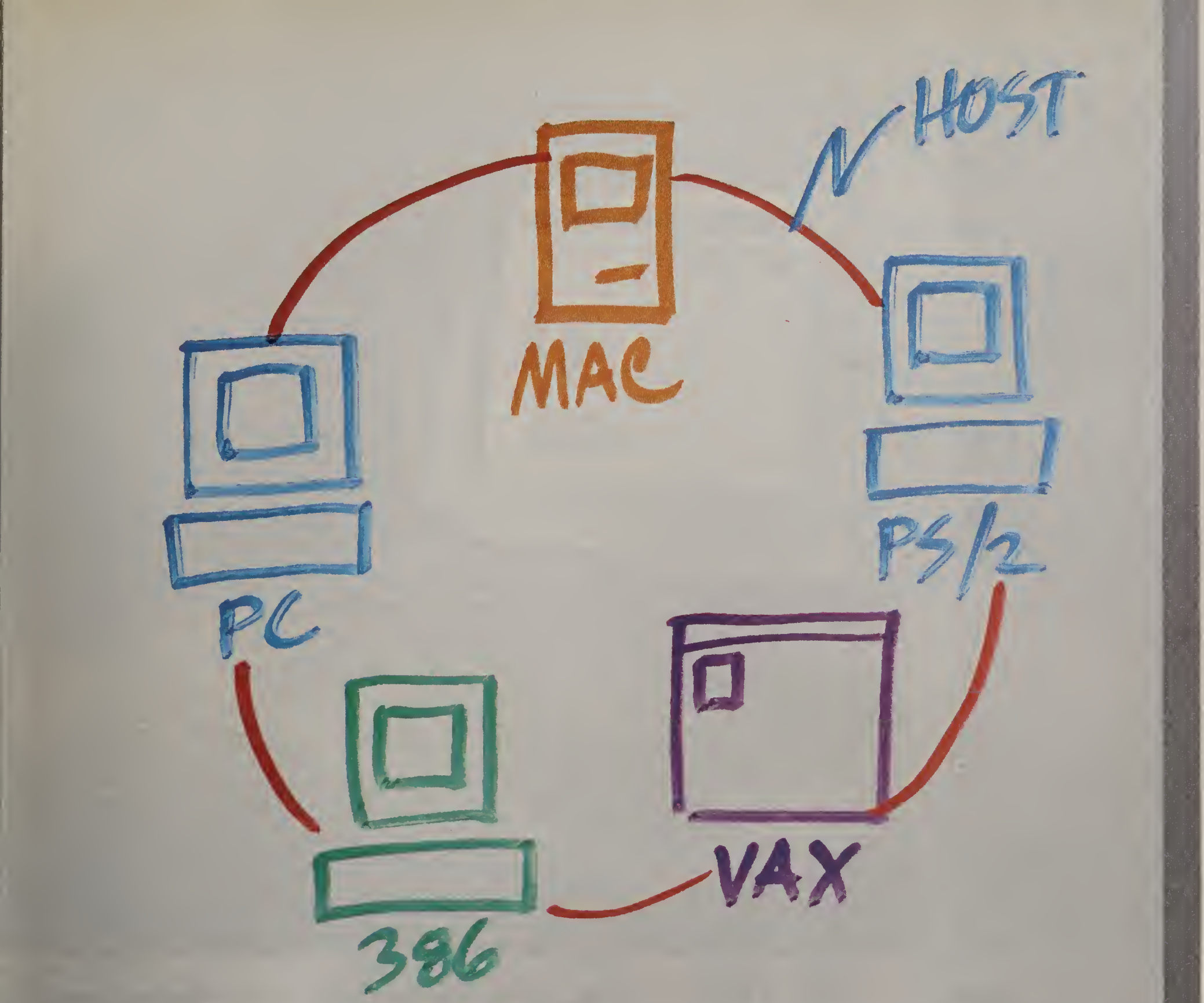


and you can choose all of these.

functionality and system reliability available. Plus you get the power to transparently connect to any of the more than two million users worldwide who have already chosen NetWare.

And as your computing needs expand, the network will grow with you. Giving greater networking capability and allowing you to connect to new environments.

The freedom to choose. Exercise your freedom to choose the desktop environment that best meets your needs. Choose the networking power of NetWare. See your Gold Novell Authorized Reseller, or call 1-800-LANKIND.

For more information, call from your modem 1-800-444-4472 (8 bit, no parity, 1 stop bit) and enter the access code NVFRE7.

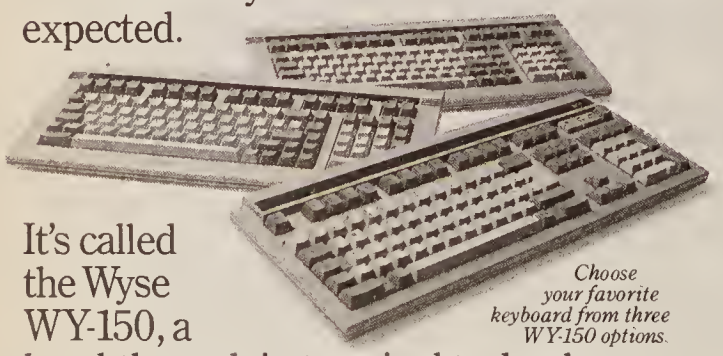
NOVELL

For network solutions,
you should be seeing red.

The Terminal Of The '90s Has Arrived A Bit Early.

Wyse introduces the WY-150.
They always said there would be such a terminal "someday". It would have the flexibility and connectivity to operate in virtually any computing environment, while meeting the most exacting ergonomic requirements. And, it would deliver those advantages at an affordable price.

"Someday" is here much sooner than expected.



Choose your favorite keyboard from three WY-150 options.

It's called the Wyse WY-150, a breakthrough in terminal technology that will set price/performance standards for years to come.

Bridging the worlds of ASCII, ANSI and PCs, the WY-150 offers compatibility with a wide range of operating systems. Including UNIX/XENIX, MS-DOS, Concurrent DOS, PC-MOS, and PICK. With a choice of three keyboards. And typical of Wyse, the WY-150 does it all with stylish design at a price that's also attractive.

The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

The WY-150 is also part of *SystemWyse*. It links effortlessly with Wyse PCs and multi-user platforms to create uniquely integrated and cost-effective solutions. Everything is designed, manufactured, and tested by Wyse to work together. And it's all backed by the service and support of the world's leading independent terminal maker.*

Only one question remains. Now that the terminal of the '90s is here, what are you waiting for? Call today for more information on the WY-150.

1-800-GET-WYSE

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WYSE

We make it better, or we just don't make it.

Continued from page 67

modating a mix of 2,400 and 9.6K bit/sec. modems. An IBM Personal Computer AT, Personal System/2 or compatible system with a 20M-byte hard disk and IBM Enhanced Graphics Adapter color monitor is required.

Concord Data Systems, 45 Bartlett St., Marlboro, Mass. 01752. 508-460-0808.

A network control and communications package is available from **Westinghouse Electric Corp.'s Management Systems Software** divsion.

The **Westinghouse Integrated Network Solutions** package is reportedly capable of running across all IBM operating systems and incorporates the company's Network Control Interface and Multiple Session Manager products.

Pricing ranges from $1,600 to $20,000 per function and is dependent on system configuration and options.

Westinghouse Electric, P.O. Box 2728, Pittsburgh, Pa. 15230. 800-348-3523.

Vitalink Communications Corp. has announced a wide-area network management product for IEEE 802-standard networks.

The workstation-based **802 Wanmanager** allows users to view the entire operational status of a WAN, including links, bridges and local-area networks, the vendor said.

The network operator can monitor, analyze and control the complete WAN via a mouse, icons and pull-down menus, the company said.

Wanmanager software and documentation costs $30,000.

Vitalink, 6607 Kaiser Drive, Fremont, Calif. 94555. 415-795-6178.

OS/2 networking

Ungermann-Bass, Inc. has announced a network operating system based on Microsoft Corp.'s LAN Manager.

According to the vendor, **Net/One MS OS/2 LAN Manager** enables both OS/2 and DOS workstations to access OS/2 server resources. The product allows users to share programs and peripherals located on Ethernet or token-ring networks and costs $2,995 per server for an unlimited number of users.

Ungermann-Bass, 3900 Freedom Circle, Santa Clara, Calif. 95054. 408-496-0111.

Links

A communications product that allows facsimile transmission from Wang Laboratories, Inc. VS computers has been announced by **General Information Services, Inc.**

Called **Simplefax**, the product reportedly allows Wang users to print files and word processing documents, including messages merged with letterhead and signature blocks that are stored in the computer.

Users can then send simultaneous messages to several hundred recipients via any conventional fax machine, the company said.

The Simplefax system includes both hardware and software and is priced at $5,700.

General Information Services, 2300 Walnut St., Philadelphia, Pa. 19103. 215-557-1950.

Microcom, Inc. has expanded its LAN Bridge family of local-area network bridging systems.

The **MLB/1200** is a LAN bridge that is said to transparently link IEEE 802.3 Ethernet or IEEE 802.5 token-ring LANs over dial-up telephone lines at speeds as fast as 300K bit/sec.

The product reportedly utilizes V.32 modem technology and data compression methods and offers support for Novell, Inc.'s Netware, 3Com Corp.'s 3+, Digital Equipment Corp.'s Decnet and Transmission Control Protocol/Internet Protocol communications.

The MLB/1200 costs $6,999, according to the company.

Microcom, 1400 Providence Highway, Norwood, Mass. 02062. 617-762-8468.

Rabbit Software Corp. has released **Version 4.0** of **Rabbitstation Remote**, the company's remote connection between mainframes and IBM Personal Computers and compatible systems.

The product reportedly enables a single workstation to access mainframe information via an IBM-compatible host front-end processor using the IBM Systems Network Architecture/Synchronous Data Link Control and Binary Synchronous Communications communications protocols.

Rabbitstation Remote costs $595 for a two-host version, $795 for four-host sessions and $1,395 for eight-host sessions, the company said. Customers who have Version 3.0 may upgrade for $50 per personal computer.

Rabbit Software, Great Valley Corporate Center, 7 Great Valley Pkwy. E., Malvern, Pa. 19355. 215-647-0440.

Digital Products, Inc. has introduced a sub-local-area network with micro-to-mainframe gateway capabilities.

Netcommander 10G reportedly allows IBM mainframe and personal computer users to share an asynchronous departmental printer.

The printer, while available to the mainframe, can also be shared by as many as nine personal computers, the company said.

Pricing for Netcommander 10G ranges from $2,495 to $3,795.

Digital Products, 108 Water St., Watertown, Mass. 02172. 617-924-1680.

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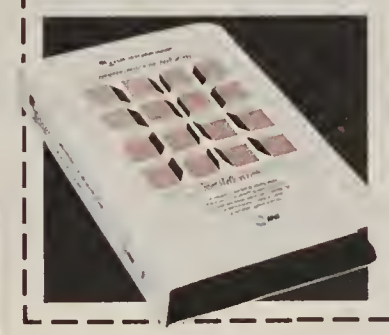

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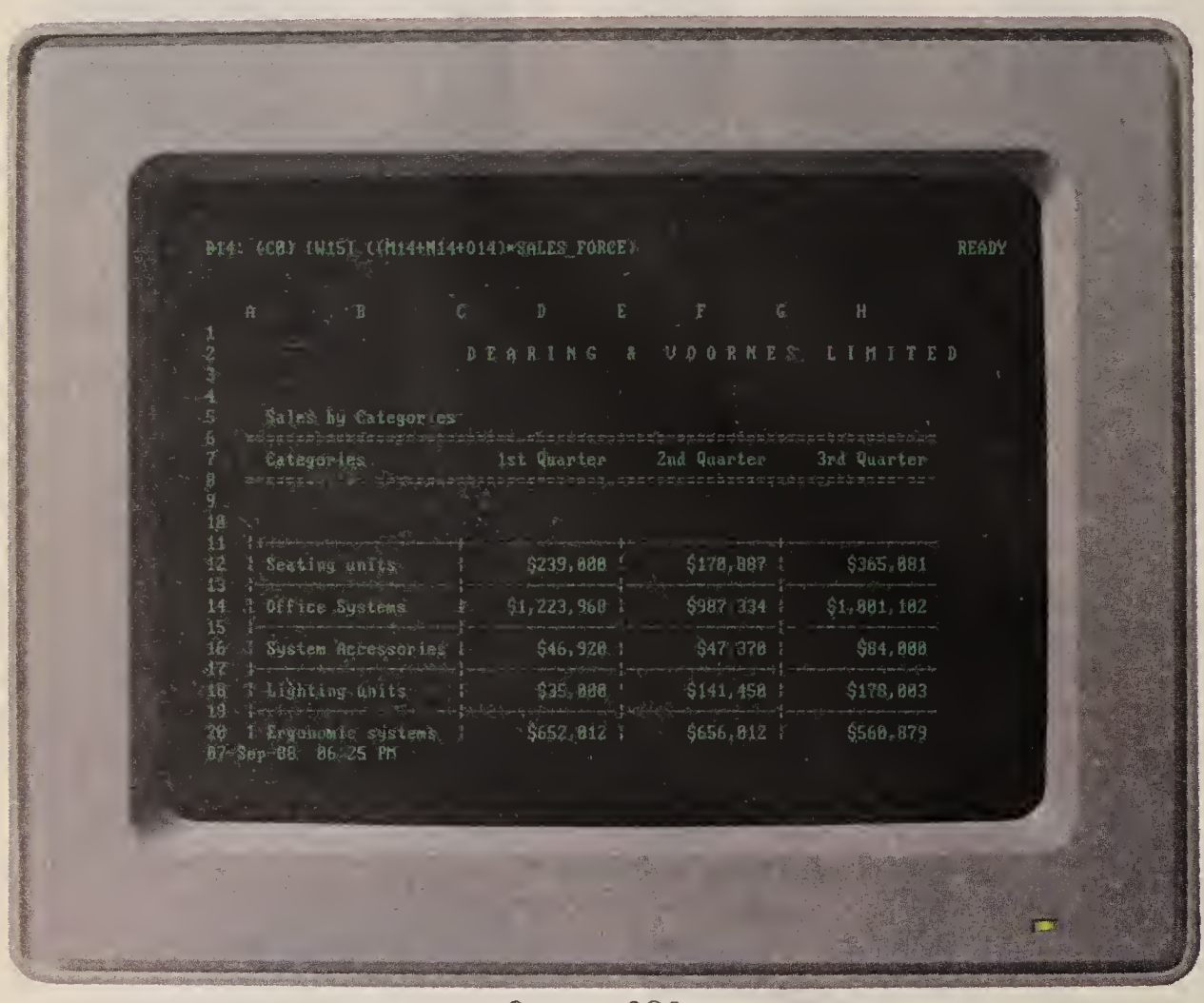
What you've been doing.

On your 286,
you've been making any task look complicated.



On your 386,
it hasn't been incredibly exciting having all that power.

If the screens on the right look more intriguing to you than those on the left, you're ready for Microsoft® Windows.

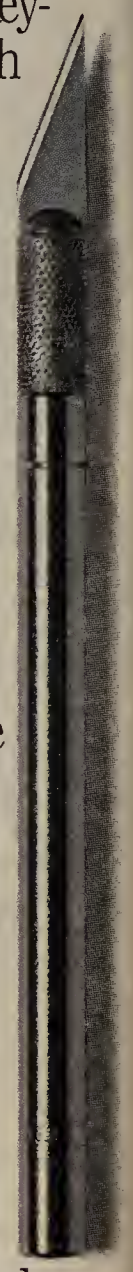
Windows opens up the world of visual thinking to all 286 and 386 owners by offering the power of graphics.

Everything you can do on your PC, you can now do better, faster and with greater imagination. Whether you're creating documents or trying to get a clearer picture of your work.

What used to take complicated keystrokes can now be accomplished with the simple click of a mouse. With Microsoft Windows, you access pull-down menus. Simultaneously work with different programs as well as cut and paste between them to create graphic examples within different bodies of text. And what you see on the screen will appear on your printed page.

And once you've learned Microsoft Windows, you'll have the basis for scores of other programs because all the countless new Windows applications are based on the same easy, logical format.

Since Microsoft Windows virtually looks and works like MS® OS/2 Presentation Manager, you won't have to worry about it becoming obsolete in a couple years. We made both systems compatible. So, in the future, you'll be able to share data between them. And your knowledge of Windows will give you a jump on learning MS OS/2 Presentation Manager.



Stop playing with ancient instruments. Now cutting and pasting is a simple point and click with the Microsoft Mouse.

You'd expect a program this powerful to require a more powerful machine. But we consistently create software that makes

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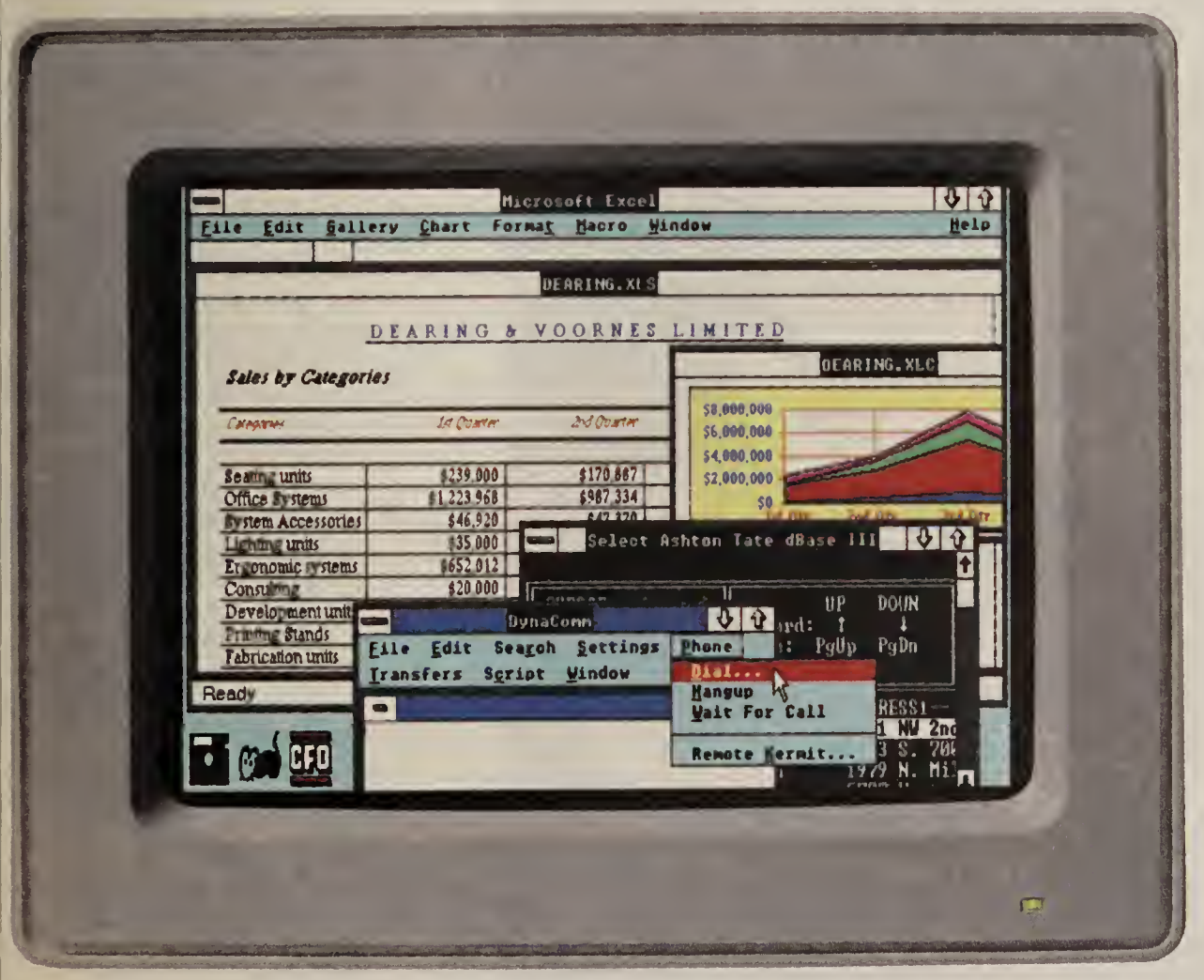
The following products have been used courtesy of their respective developers: Lotus and 1-2-3 by Lotus Development Corporation; WordPerfect by WordPerfect Corporation; PageMaker by Aldus

What you could have been doing.

With Windows/286,
you could have been seeing things much more clearly.



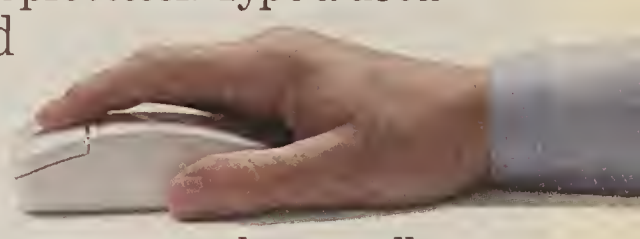
With Windows/386,
you could have been seeing a lot more things much more clearly.

the best use of your present hardware.

For example, Microsoft Windows/286 will work with as little as 640K and instantly make your machine more sensitive, intuitive and highly visual. It gives you the ability to run every Windows application available. And with access to all those powerful programs, you'll be able to extend the life and usefulness of your 286 well beyond the introduction of MS OS/2 Presentation Manager. With version 2.1 you also get the benefit of increased speed. So you'll blaze through Windows applications up to 87% faster.

Microsoft Windows/386 will give you everything that Windows/286 gives you. Plus multitasking with most DOS applications. Now you can finally utilize the speed and power of any 386 machine.

Imagine creating a complicated spreadsheet. Then while a macro is being run, open up a word processor. Type a document, open and work with a graphics program. Cut and paste between programs and even call up electronic mail. And still be able to check on the status of your spreadsheet at any time.



Considering all you can do with Microsoft Windows, you have only one question to ask yourself.

What have you been doing without it?

Microsoft®
Making it all make sense.™

Corporation; dBASE III PLUS by Ashton-Tate Corporation; Network Courier by Consumers Software, Incorporated; Micrografx by Micrografx, Incorporated; Pack*Rat* by Polaris Software; and CFO Advisor by Financial Feasibilities, Incorporated. Pack*Rat* is a trademark of Polaris Software. CFO Advisor is a trademark of Financial Feasibilities, Incorporated.

Madge Networks Ltd. has introduced a source routing bridge designed for splitting token-ring local-area networks to improve network performance and enhance security.

The personal computer-based **Madge Ring Bridge** alleviates network overloading by dividing any IEEE 802.5 token-ring network into two subrings that are connected to each other, the vendor said. It is compatible with the IBM Source Routing Bridge and supports IBM source routing protocols.

The Madge Ring Bridge costs $2,625 and includes two modified Madge AT Ring Nodes and bridge software.

Madge Networks, 534 Salem Ave. S.W., Roanoke, Va. 24016. 703-982-0638.

Black Box *emulation cards for IBM System/34, 36, 38*

Black Box Corp. has announced two software emulation cards for users of IBM System/34, 36, 38 and Application System/400 mid-range computers.

Both cards allow the IBM Personal Computer to operate as a standard IBM 5251 Model 11, 5291 or 5292 Model 1 display terminal, the vendor said.

The **5251-11 Plus Emulation Card** is available for IBM PCs, and the **5251-11 MC Plus** performs the same emulation for the IBM Personal System/2.

Each card costs $995.

Black Box, Box 12800, Mayview Road at Park Drive, Pittsburgh, Pa. 15241. 412-746-5500.

Communication Machinery Corp. (CMC) has broadened its Motorola, Inc. VMEbus product line to include a family of Ethernet link-level controllers for VMEbus host systems.

The ENP L-Series consists of two products: the **ENP-10L** and the **ENP-100L.** The ENP-10L is a 16-bit link-level controller that includes a 10-MHz Motorola 68000 microprocessor with 128K bytes of memory.

The ENP-100L is reported to be a 32-bit link-level controller that includes a 12.5-MHz 68020 microprocessor with 256K bytes of memory.

The ENP-10L costs $1,595, and the ENP-100L costs $2,395.

CMC, 125 Cremona Drive, Santa Barbara, Calif. 93117. 805-968-4262.

A network interface designed to connect a Digital Equipment Corp. VAX system to users on a private branch exchange (PBX) network has been announced by **Advanced Communications Corp.**

The **ACP 6640** interface uses the DEC Multiplex Interface protocol and permits up to 23 terminals or workstations on the PBX to access a DEC VAX machine via a single twisted-pair line transmitting data at T1 rates, the vendor said.

The ACP 6640 costs $10,000 and has been qualified for use with AT&T's System 75 and 85 PBXs, Harris Corp.'s 20-20 PBX and the NEAX2400PBX from NEC Corp.

Advanced Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.

Halley Systems, Inc. has expanded its Connectlan remote Ethernet Brouter family.

The latest **Connectlan 100 Brouters** reportedly connect geographically dispersed local-area networks over a variety of wide-area serial telecommunications links. The products can support Ethernet-to-Ethernet local or remote links, the vendor said.

Four configurations of the Connectlan 100 Brouters are available, with prices starting at $9,000.

Halley Systems, 2730 Orchard Pkwy., San Jose, Calif. 95134. 408-432-2600.

A networking gateway for IBM tape subsystems has been announced by **Computer Network Technology Corp.**

Designated **Model 5480**, the product reportedly connects IBM and compatible mainframe computers to IBM and compatible 3480 and 3420 tape subsystems. A basic network configuration is priced at approximately $85,000.

The company has also announced a networking gateway designed specifically to link IBM mainframes and Teradata Corp's DBC/1012 database computers.

The **Model 5412** gateway product is available for approximately $95,000 in a base configuration.

Computer Network Technology, 9440 Science Center Drive, Minneapolis, Minn. 55428. 612-535-8111.

Relay Communications, Inc. has announced that its Relay/3270 mainframe software is now available for VTAM sites.

Relay/3270 for MVS/VTAM reportedly allows personal computers running Relay Gold to emulate an IBM 3270 terminal without 3270 emulation boards or coaxial cables.

The product requires an IBM mainframe running MVS/SP or MVS/XA with VTAM and a telecommunications control unit with asychronous support, the company said.

Continued on page 78

UNIX® Applications You Need Most

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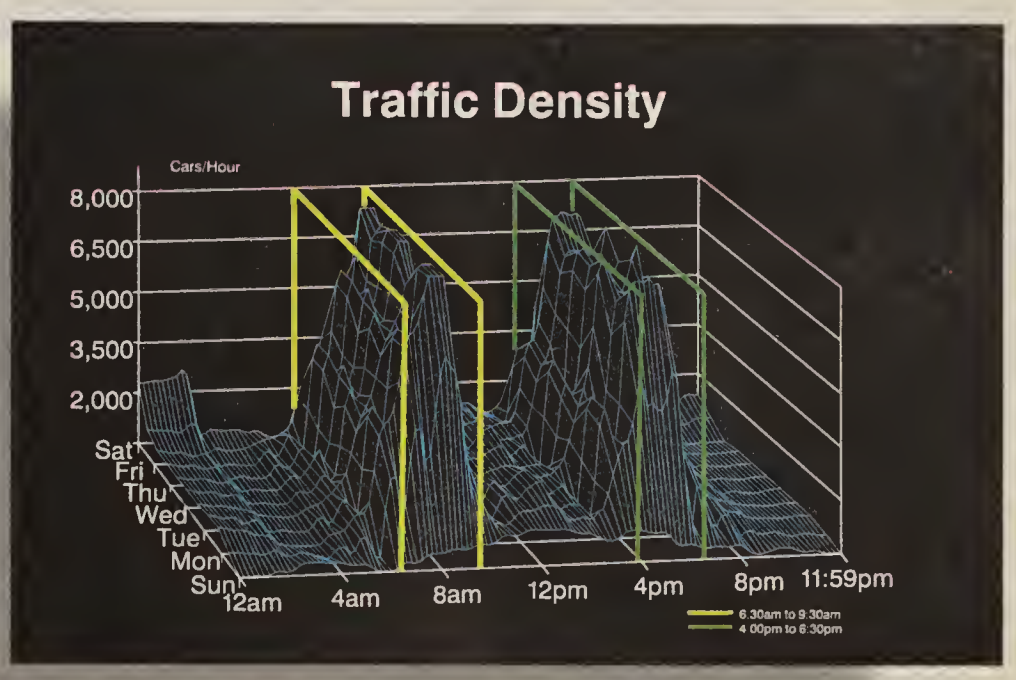
The SAS System **is** the #1 choice for data analysis and graphics. The SAS System **is** the all-purpose answer for business analysts, statisticians, researchers, and students. The SAS System **is** backed by an industry leader.

You get software that's powerful, productive, and **proven** for the UNIX applications you need most. On everything from single-user workstations to multi-user systems.



The SAS System runs on Sun Microsystems, Inc.'s Sun workstations under SunOS®; Hewlett-Packard's HP 9000 workstations under HP-UX; and on mainframes, minicomputers, and personal computers.

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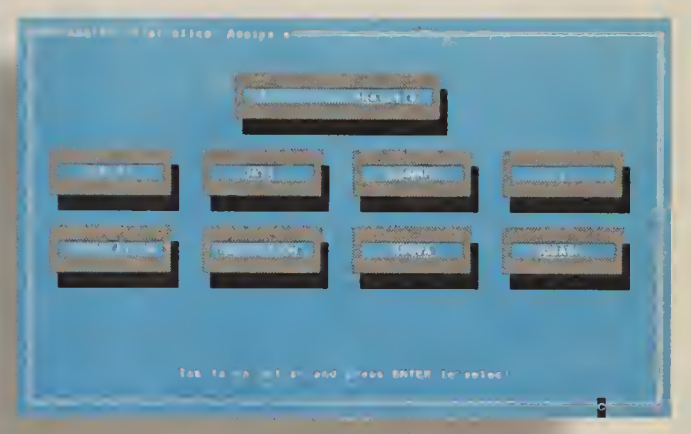
Superior Data Analysis

Reliable statistics are a hallmark of the SAS System, from simple frequency counts to complex multivariate techniques. Monitor experimental data on a day-to-day basis. Compute analysis of variance for both balanced and unbalanced data. Perform regression analysis and build linear models.

There's also an interactive matrix language for your advanced mathematical and engineering applications.



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The SAS System reads data in any format. Then you can sort, merge, and concatenate data using common-sense statements. File updates are easy, too. Create customized screens for faster data entry with fewer errors.

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Communicate your findings in everything from simple lists to full-color graphics, often with just a few keystrokes. Produce tables, charts, calendars, and other formatted reports. Or display your data in attention-getting charts—from pie charts to 3D plots to prism maps.

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Announcing a data networking breakthrough. Northern Telecom introduces the new corporate-wide Meridian Data Networking System.

At last you can bridge the gaps of distance, time and incompatibility—to harness the full power of your data resources.

The Meridian Data Networking System is a breakthrough approach to connecting a company's computers and terminals into one high-value network.

And it's already at work at several corporations recognized for their leadership in data networks.

Now information is easy to reach. To find the application you want, simply select it by name from a menu. Meridian DNS knows where and on what kind of computer the application is stored, how to reach it, and how to make it compatible with your terminal or PC.

Free to move information easily, you can create powerful new services never possible with your existing isolated networks. Meridian DNS lets you expand your electronic mail system throughout your company. Or extend a local area network across the country. Or access files regardless of their geographic location.

Finally, you can adapt your network to the needs of your business, instead of the other way around. Because even as the Meridian Data Networking System increases the flow of information, it reduces the cost and complexity of moving it.

Powerful management tools and a consistent, friendly man-machine interface make monitoring and controlling the network more efficient than ever. And by supporting important computing and communications standards such as SNA and OSI, it preserves your current investment in equipment and applications.

Start by linking your IBM SNA network and PC LANs today, and you're on the way to linking all your data resources—from one end of your company to the other.

We put all our digital telecommunications networking expertise behind breaking the corporate-wide data networking barrier. We're a leader in building the largest, most cost-effective and open networks ever devised. We've made them easy to use, powerful enough to connect you reliably to almost anywhere, and manageable. Everything you've wanted in your data network, but could never have.

The Meridian Data Networking System does more than open up your information system. It opens up new opportunities for your business because it gives you a competitive advantage.

Without it, you might as well be stranded on an island.

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THE POWER BEHIND NETWORKING™

Continued from page 74

Relay/3270 for MVS/VTAM costs $14,500.

Relay, 41 Kenosia Ave., Danbury, Conn. 06810. 800-847-3529.

Modems/Multiplexers

A T1 broadband data modem that performs serial transfers at the T1 (1.5M to 2M bit/sec.) rate has been introduced by **Halley Systems, Inc.**

At $3,950, the **Z2000** modem is said to be especially suited for any application requiring high point-to-point transmission and can operate across 6 to 12 MHz frequency ranges in 250-kHz steps.

Halley Systems, 2730 Orchard Pkwy., San Jose, Calif. 95134. 408-432-2600.

U.S. Robotics, Inc. has expanded its line of Courier modems with the addition of the **Courier HST Dual Standard** and **Courier V.32** modems.

The HST Dual Standard modem reportedly combines the company's HST asymmetrical full-duplex transmission with CCITT V.32 capabilities and costs $1,595. The V.32 modem, at $1,495, provides 7.2K bit/sec. fallback and the 4.8K bit/sec. fallback required under V.32 specifications.

U.S. Robotics, 8100 N. McCormick Blvd., Skokie, Ill. 60076. 312-982-5010.

U.S. Robotics' *expanded line of Courier modems*

Electronic mail

Speech Plus, Inc. has announced **Audio Email**, an electronic mail application package for its Calltext VGS product that reportedly will allow users of IBM's Professional Office System (Profs) to access mail messages and calendar information from remote sites in voice form over the telephone.

The turnkey system costs $44,700 and supports four simultaneous Profs E-mail access calls, installation, training and a 12-month warranty. The system is expandable to 32 simultaneous callers.

Speech Plus, P.O. Box 7461, 640 Clyde Court, Mountain View, Calif. 94043. 415-964-7023.

Boston Software Systems, Inc. has announced a personal computer-based software product that reportedly allows PC users to prepare electronic mail messages with information read directly from mainframe, minicomputer or PC applications.

Called **Netweaver Application/E-Mail Link**, the software also manages the flow of E-mail messages within a local- or wide-area network and can directly insert data into remote applications, the vendor said.

Netweaver costs $995 per company-wide network.

Boston Software Systems, 76 Whitney St., Sherborn, Mass. 01770. 800-356-4933.

Cincom Systems, Inc. has announced a memo facility for its Net/Master integrated network and systems management product.

Called **Net/Mail**, the component is said to be fully integrated with other Net/Master facilities to manage VTAM networks and routes messages to individuals, distribution groups or bulletin boards, according to the company.

Net/Mail is priced from $2,500 to $10,000, depending on which mainframe model and operating system is used, the company said.

Cincom, 2300 Montana Ave., Cincinnati, Ohio 45211. 513-662-2300.

Protocol converters

JDS Microprocessing has expanded its line of direct channel-attached protocol converters and controllers with the addition of **Hydra SNA.**

Featuring Systems Network Architecture support, the product connects directly to the mainframe channel and incorporates the functions of an IBM 3274 cluster controller and an IBM 3270 protocol converter.

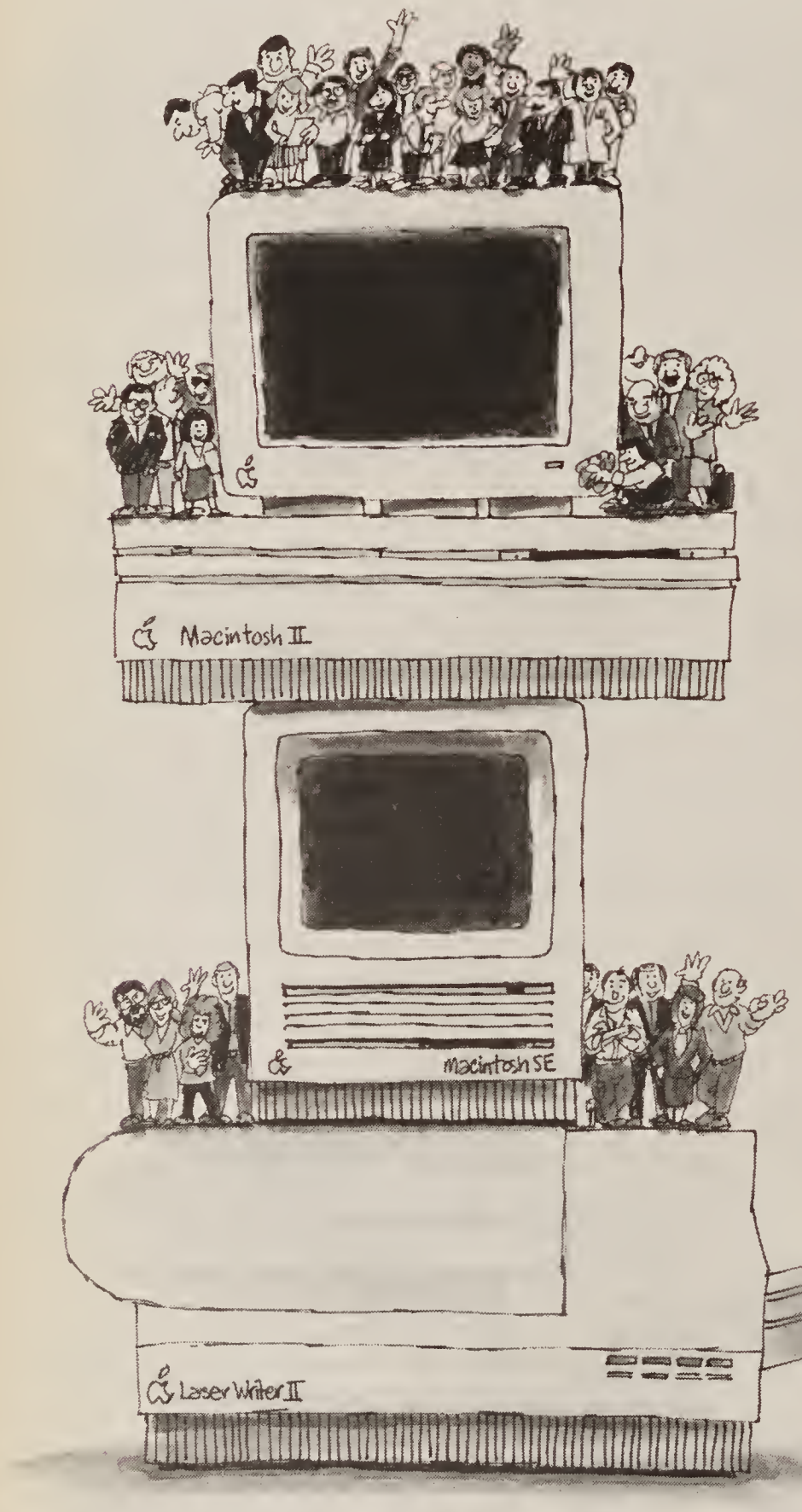
According to the vendor, the price for a 16-port model is $12,900, and each eight-port increment upon initial purchase costs an additional $1,000.

JDS, Suite 206, 22661 Lambert St., El Toro, Calif. 92630. 714-770-2263.

A protocol conversion device for IBM Personal Computers, PC XTs, ATs and Personal System/2 Model 25s and 30s has been announced by **Modems Plus, Inc.**

According to the vendor, **Microsnap** allows PCs to communicate with any IBM-compatible front-end processor in three modes: 3770 SNA/SDLC batch; 2780/3780 BSC RJE; and 3270 SNA/SDLC. The plug-in card is interfaced to a modem or front-end processor directly via a DB-25 connector and is priced at $995.

Modems Plus, 3180A Presidential Ave., Atlanta, Ga. 30340. 404-458-2232.



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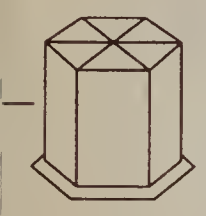

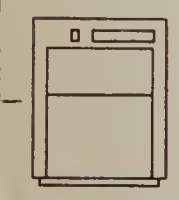

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Carlos Cadalzo is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development tool that helps analysts design screens for CICS and IMS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the buying market for this new tool. And for Carlos, the first option that came to mind was *Computerworld.*

"I wasn't sure exactly how to do it, but I knew that Computerworld *reaches the people we want to talk to. So when I met with a* Computerworld *sales representative and described the situation, he suggested* Computerworld *Response Card decks.*

"The result was great news all around. I learned there is definitely a market for the Quick Screen 3270 — and that Computerworld *Response Cards reach that market. I know this because we got 260 cards back right away. And four weeks later they were still coming in, which is also very impressive.*

"At first we were concerned that we didn't have the resources to do a full market study, but the cards told us everything we needed to know. We got both quantity and quality in terms of responses. At least 20 cards came back from Fortune 500 companies alone.

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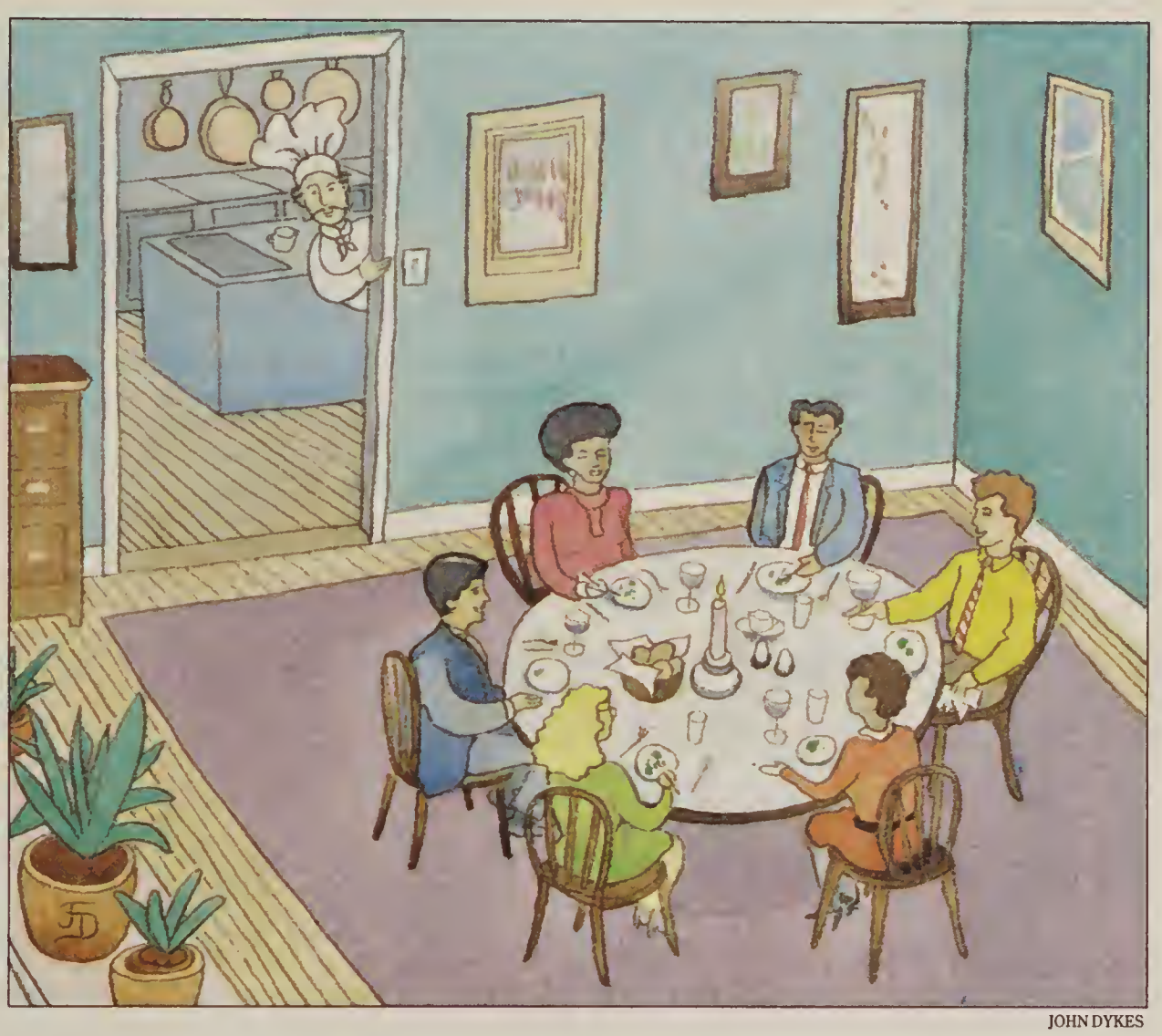
LAN SOFTWARE

LAN users start to crave heartier fare



JOHN DYKES

BY JOSH BRACKETT

The murmurs have just begun, but it is expected that before long, corporate users of local-area networks will be raising their voices to demand software that will permit more functionality in that environment.

"Until fairly recently," says Bruce Grant, director of technical support at Microage, Inc. in Tempe, Ariz., "people looked at LANs as just a way to share hardware resources, particularly laser printers and disk drives." As they gain experience, he explains, they want to do more in terms of sharing data and documents.

Larry Stouder, manager of technical development at Continental Grain Co. in New York, is one of those who has begun to think about the next stages of LAN development. He describes the LANs at his company as general-purpose systems for office automation and communications. "There isn't a tremendous amount [of additional capability] that we need immediately," Stouder says, "but on the horizon, I think database server technology would be extemely attractive."

Any progress beyond hardware sharing requires, at minimum, what Grant terms "network-aware" software. By this, he means software that knows how to protect its own data from damage if two or more users reach for the same file.

To use a file resident on a file server running Microsoft Corp. MS- and IBM PC-DOS, the user downloads it from the file server to the workstation. Network-aware software knows how to tell the server to lock out any other user who tries to get to the original file before the current user updates it. Word processing software and some quick rewrites of single-user versions of database software lock up the whole file. More advanced network versions lock only the individual record involved and lock it only against changes, not against mere reading.

Packages that do this are still the exception rather than the rule in micro-based applications, Grant says, but that is changing rapidly.

The next step for LAN users beyond network-aware versions of stand-alone software is "network-intrinsic" software, which Grant defines as software designed from the ground up to run efficiently on a network. The simplest form of this is E-mail, and most networks today do not run any other kind of network-intrinsic software.

There is also an emerging genre of network-intrinsic applications called groupware. This category includes office automation-type functions, such as group editing of documents, group calendaring, project management, voice messaging and call tracking. Groupware, however, is neither fully defined nor developed and has had little impact so far. Grant ascribes this apathy to the applications available. "Until somebody comes out with a compelling groupware application," he says, "it's not going to really get visibility."

Susanna Opper, a New York-based consultant who helps companies increase work group communication and productivity, sees other restrictions. In order to be really useful, she says, this kind of software really requires both windows and multitasking capabilities or, in other words, IBM and Microsoft's OS/2 and IBM's Presentation Manager.

That brings us to one of the major bottlenecks in the supply of effective software for LANs — the MS-DOS operating system. To begin with, it is a single-tasking operating system ill-suited to work group-type applications. MS-DOS has a 640K-byte memory limit, which inhibits the power of the applications that can be designed for it. And, most important, an MS-DOS file server can only do file serving.

This means, for example, that if a user at a workstation running

Brackett is a free-lance writer who lives in Rockport, Mass., and specializes in computers and communications.

INSIDE

Beyond Co-existence
Mixed-system LANs introduce new layers of complexity.
Page 86.

Mail Delivery
LANS could be the vehicle that finally brings electronic mail up to potential.
Page 88.

Heartier fare

CONTINUED FROM PAGE 83

Ashton-Tate Corp.'s Dbase III+, for example, wants to search through a file on the server, the server has to send the whole file down the wire, one record at a time. The Dbase search program inspects each record at the workstation. As long as the network is being used primarily for hardware sharing, this is satisfactory. But as soon as traffic gets heavy, as in a multiuser sales or order-entry situation, the network begins to bog down.

This smart workstation/dumb server architecture is the opposite of the way that minicomputers and mainframes work. In a mini-mainframe scenario, the database software resides on the host, which could also be considered a server. The workstation asks for the record it wants; the host computer searches through the database, finds the record and sends it back down the wire.

Personal computers were put on desk tops partly to avoid the disadvantages of the host/terminal architecture. Users prefer the PC's quick response, user-friendly interface and sense of control over their own data. They were never meant to handle large central databases. Historically, that task is under the domain of minis and mainframes. But now, LAN users such as Strouder are starting to ask for that kind of capability on a LAN.

Developers say the best option for those who want to use LANs in this way is distributed processing, an architecture under which both the workstation and the server are smart.

Distributed processing deposits software partly on the workstation and partly on the server. The front end is the user interface; the back end, which runs on the server, is where the real work is done.

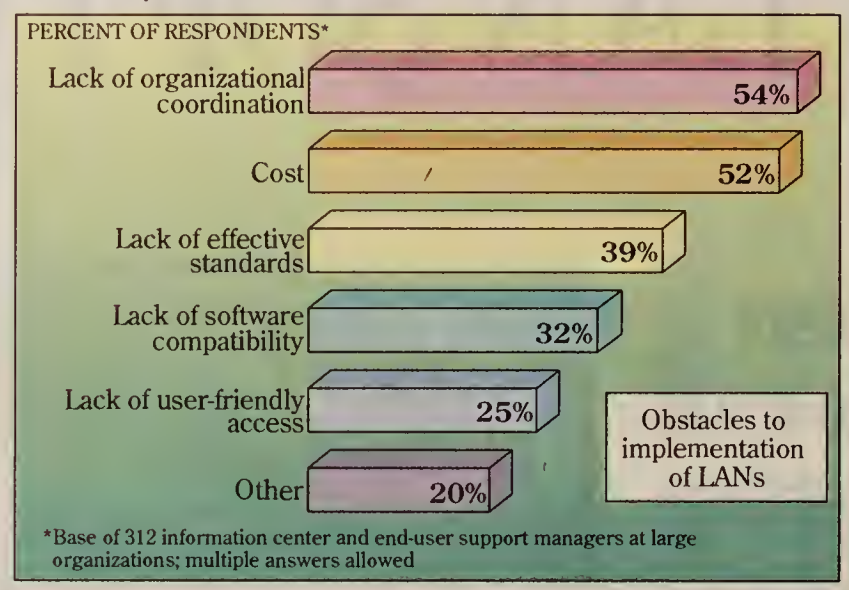
Distributed processing over a LAN makes it possible for a database system to combine the best features of minicomputers and mainframes — smart file service, high speed, large storage and tight security — with the best features of microcomputers — user-friendly interfaces, color displays and printing formats, quick response, low maintenance and low price. These capabilities make the idea attractive for distributed database applications.

This natural affinity has not escaped the attention of vendors in either arena, and some interesting alliances and cross-pollinations have begun to take place as a result. The last few months, for example, have witnessed the following developments:

- Microsoft, Ashton-Tate and Sybase, Inc., a relational database management system developer in Berkeley, Calif., have teamed up to produce SQL Server, a database server that Microsoft hopes will become an industry standard.
- Oracle Corp., a database management system developer in Belmont, Calif., has introduced Oracle Server, a proprietary front- and back-end database system that runs on DOS and OS/2 and on many network operating systems.
- Novell, Inc. in Provo, Utah, has announced marketing alliances with Oracle as well as Ashton-Tate and also Emeryville, Calif.-based Action Technologies, Inc., developers of a groupware product called The Coordinator.

Implementation roadblocks

Lack of an organizational plan is considered more of an impediment than lack of standards



*Base of 312 information center and end-user support managers at large organizations; multiple answers allowed

SOURCE: CRWTH COMPUTER COURSEWARES
CW CHART

Distributed processing is not only about database applications, however. Other applications, such as document management systems, computer-aided design drawing libraries, group spreadsheets and bulletin boards can benefit from running partly on a central server instead of entirely on the workstation.

Distributed processing also allows communications with remote users to be centralized on a communications server instead of being spread around the network to each workstation. This makes it possible to communicate efficiently with other LANs and to include remote users in a "local-area" network to create what one user calls a "logical LAN."

That person, Ray Thomas, is office automation manager at Hadson Gas Systems, Inc. in Dallas. Hadson, he says, is currently supporting users in five cities on a Hewlett-Packard Co. LAN and wide-area network (WAN) system connected via a transaction processing HP 3000.

Within this user population, he says, several groups performing the same kinds of work form what amounts to "multiple logical LANs that stretch geographically across the whole nation."

Right now, the extent of dynamic interaction between these interest groups or extended work groups is extremely limited. What Thomas would like is what Fred Litwin, vice-president of LAN Systems, Inc., a New York-based LAN systems integrator, says a lot of LAN users would like: "Better distributed applications across WANs, so you can have a database in New York and let the server in New York do all the work and chug out answers for people in L.A."

Fanning the fire

If distributed processing is the better approach, why isn't it more prevalent? Again, the answer is in the limitations of operating systems.

To do any kind of resource sharing, users need a transparent extension of their workstation operating systems that controls traffic on the network. In 1984, Microsoft provided Microsoft Networks (MS-Nets) for that purpose. MS-Nets was based on Version 3.1 of MS-DOS and on Netbios, IBM's hardware-interface software system that establishes communications sessions between workstations, sends data around the network and enables record locking.

MS-Nets made it possible for many LANs to get up and running, but was hobbled by DOS' previously mentioned limitations.

Novell saw the opportunity, and it jumped in with Netware, a proprietary multitasking network operating system that emulates Netbios and runs DOS 3.1 as a task, providing much better performance. Netware also provides password security, network monitoring, print spooling and electronic mail. Since Netware's release, Novell has captured about 40% of the market.

Enter OS/2. As a workstation operating system, OS/2 has not set the world on fire, but it may be the spark that LANs have needed.

J. Scott Haugdahl, a consultant and seminar leader with Architecture Technology Corp., a Minneapolis firm that follows the LAN industry, says that while "workstations can migrate to OS/2 if they need it, the LAN is where OS/2 will find a home." Why? Because OS/2 is a multitasking operating system, and multitasking on a file server makes distributed processing possible.

Interprocess communications

One of OS/2's multitasking features is interprocess communications, which enables a process running on a workstation to pass information to another. Users can reach into a database, for example, pull out numbers and insert them into a report they are writing. Two processes talking to each other on the same machine leads naturally to two processes talking to each other on different machines.

Shortly after workstation-based OS/2 came out in April 1987, Microsoft and IBM jointly introduced OS/2 LAN Manager. This network operating system runs under OS/2 on the server and under either OS/2 or DOS on each workstation.

Under LAN Manager, the server can also be a workstation; it need not be dedicated to serving. A DOS redirector or an OS/2 redirector, as appropriate, sits on each workstation and mediates between its operating system and Netbios. A server redirector sits on the server and does likewise. Netbios, in turn, talks to all the standard network transport protocols.

This capability enables LAN Manager to run on a lot of networks. It also allows Microsoft to introduce Unix (AT&T, Sun Microsystems, Inc.) and Digital Equipment Corp. VAX/VMS server versions to enable network users to access files on servers running those operating systems, too. Microsoft is expected to come out with those versions some time next year.

3Com Corp. was the first to ship LAN Manager, having worked with Microsoft from the beginning on its development. 3Com's LAN Manager-based 3+Open includes compatibility and connectivity with Macintosh workstations and with local and remote computers and networks of all kinds, using operating systems

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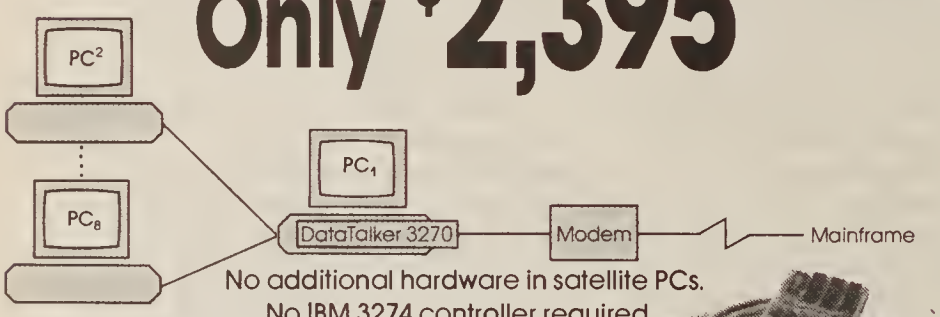

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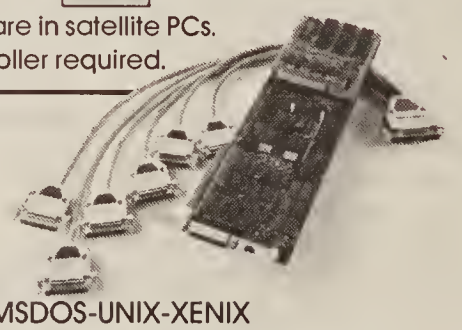

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and protocols favored in corporate settings: Unix, X.400, X.25, IBM's Synchronous Data Link Control and Systems Network Architecture, T1 and Xerox Corp.'s Xerox Network System, among others. 3+Open also beefs up LAN Manager's somewhat weak messaging capabilities.

OS/2 LAN Manager supports true multiuser applications, which a file server in a distributed processing environment needs to do, but Netware in its simplest form does not. The problem with distributed processing is that both Netware and OS/2 are Intel Corp. 80286-based protected-mode operating systems. They cannot both run on the same server.

There are two possible solutions: Either rewrite Netware so that it can run under OS/2 on the server or add another processor. Novell offers both alternatives. Nondedicated Netware for OS/2 is a modified version of Netware that runs as a task under OS/2. The Netware Applications Coprocessor is an add-in board that takes over the application processing so the server can do its Netware job of file I/O. Thus, Netware users can run OS/2 and OS/2 distributed applications.

None of these developments are going to result in a flood of new applications for LANs. Programming for OS/2 and a LAN is bound to be a lot more complicated than writing for DOS, and distributed LAN applications will take a lot longer to develop than single-user packages.

And even when the applications do begin to emerge, prudent managers will exercise caution in implementing them.

Peter Bock, a consultant and professor of computer science at George Washington University in Washington, D.C., notes that smart servers will lead to more centralized databases running on LANs.

LAST BUT not least, there is the issue of cultural adjustment. Work group computing is not a style that comes easily to all LAN users.

Watch those eggs

This trend has its risks as well as its advantages, however. "A central database buys you efficiency, management control, security and regular backup," he says, "but the price is having all your eggs in one basket." If something goes wrong and that basket gets dropped, there would be no one to blame for the mess except a relatively low-paid administrator, who cannot really be held accountable.

It also remains to be seen if everything will come out as modular and interoperable as it is supposed to be.

"What a manager wants," says Dick Lefkon, assistant vice-president of Citicorp in New York and chairman of the Data Processing Management Association's office systems standards committee, "is something on the box that says, 'this product is safe to use.'"

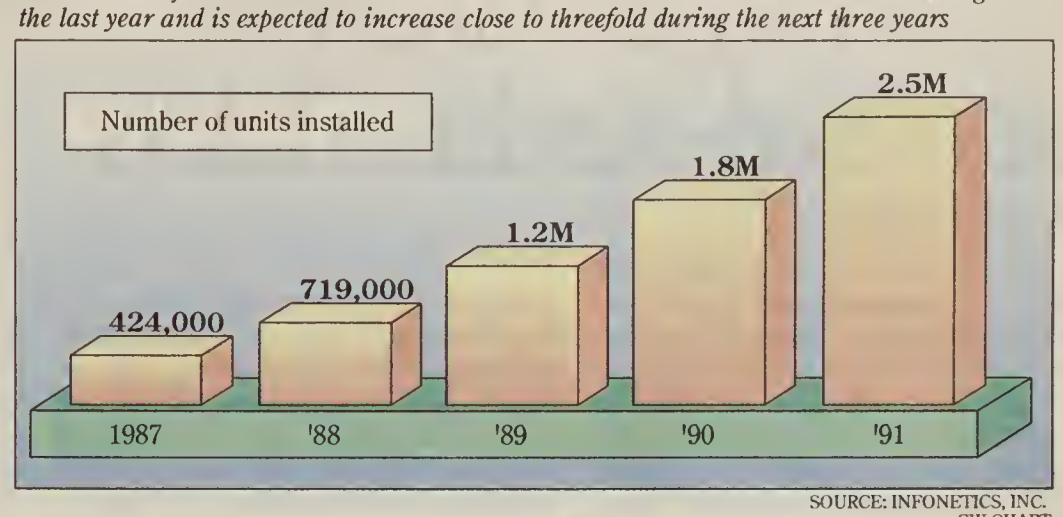
Last but not least, there is the issue of cultural adjustment. Work group computing is not a style that comes easily to all LAN users. When people work together, for example, power struggles can develop. Those who have seen the groupware packages now on the market say that this software seems to have a way of stirring these struggles up.

One popular package that stressed definite requests and commitments as a way to increase group productivity had to be rewritten. It worked well when the power relationships among users were defined, either between peers or a traditional hierarchy. But at sites at which the pecking order was unclear, users called it "fascist" software and would not use it. Leith Anderson, a LAN value-added reseller in Bloomington, Ind., says that when you talk to a customer about groupware, "you're not selling a computer system; you're selling a whole culture."

Anderson, who has installed a great many LANs, expects that it will take a year or more before the smoke clears. But when it does, he adds, "there are interesting times coming." •

Steady climb

The number of worldwide installed PC and Macintosh networks almost doubled during the last year and is expected to increase close to threefold during the next three years



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Resolving differences on mixed-machine LANs

BY ED TITTEL

Today, local-area networks provide the most common means of sharing information among dissimilar computers. Heterogeneous LANs, which link machines of multiple brands and sizes over a common medium, are an increasingly common sight. At the moment, however, trade relations in these enclaves are limited.

While a LAN connection does make the file transport mechanics easier, it does not allow applications that originate on dissimilar machines to communicate with each other easily. An application file that originates on an Apple Computer, Inc. Macintosh, for example, must still be converted into a form that a personal computer on the same network can understand.

The job of moving data among incompatible applications on multiple machines across these networks is usually a two-stage process. First, files must be massaged to fit the file system of the recipient machine. Then their contents must be reformatted to make the data acceptable to a particular application.

The following description of how this is accomplished shows that even apparently simple application exchanges require some ingenuity.

"The important thing to know is what the formats on either end have to look like," says John VanMunster, Apple support coordinator at Motorola, Inc.'s Oak Hill, Texas, integrated circuit manufacturing plant.

THERE is a difference between getting information from Point A to Point B and getting it there in usable form.

Growing network

VanMunster supports Motorola's growing population of Macintosh users. These users are connected to the sitewide Transmission Control Protocol/Internet Protocol (TCP/IP) LAN, which also supports workstations from Sun Microsystems, Inc. and Apollo Computer, Inc., a Hewlett-Packard Co. 9000 minicomputer and process control machines. The connection is accomplished using the public-domain National Center for Supercomputing Applications Telnet TCP/IP software, along with Kinetics, Inc.'s Etherport cards on the users' Mac SEs and Mac IIs for direct Ethernet connections.

The Macs on the network are used for all kinds of tasks, VanMunster explains, many of which require application interchanges with other machines on the LAN.

These exchanges include obtaining text files from the HP 9000, which not only acts as a network server but also runs circuit simulations and yield analyses; collecting raw information from the manufacturing unit's CMP-1 process control machines for statistical analysis; downloading designs from the engineering workstations to run circuit simulations; and migrating Must Software International's Nomad2 database information from IBM mainframes at the corporate headquarters into Microsoft Corp.'s Excel spreadsheets for further report creation.

VanMunster has made extensive use of the standard applications supported by the TCP/IP protocol suite (Telnet terminal emulation and File Transfer Protocol, for example) to make terminal emulation sessions and file transfers relatively straightforward, especially to other computers like the Sun workstations and the HP 9000, both of which support direct Ethernet connections using TCP/IP.

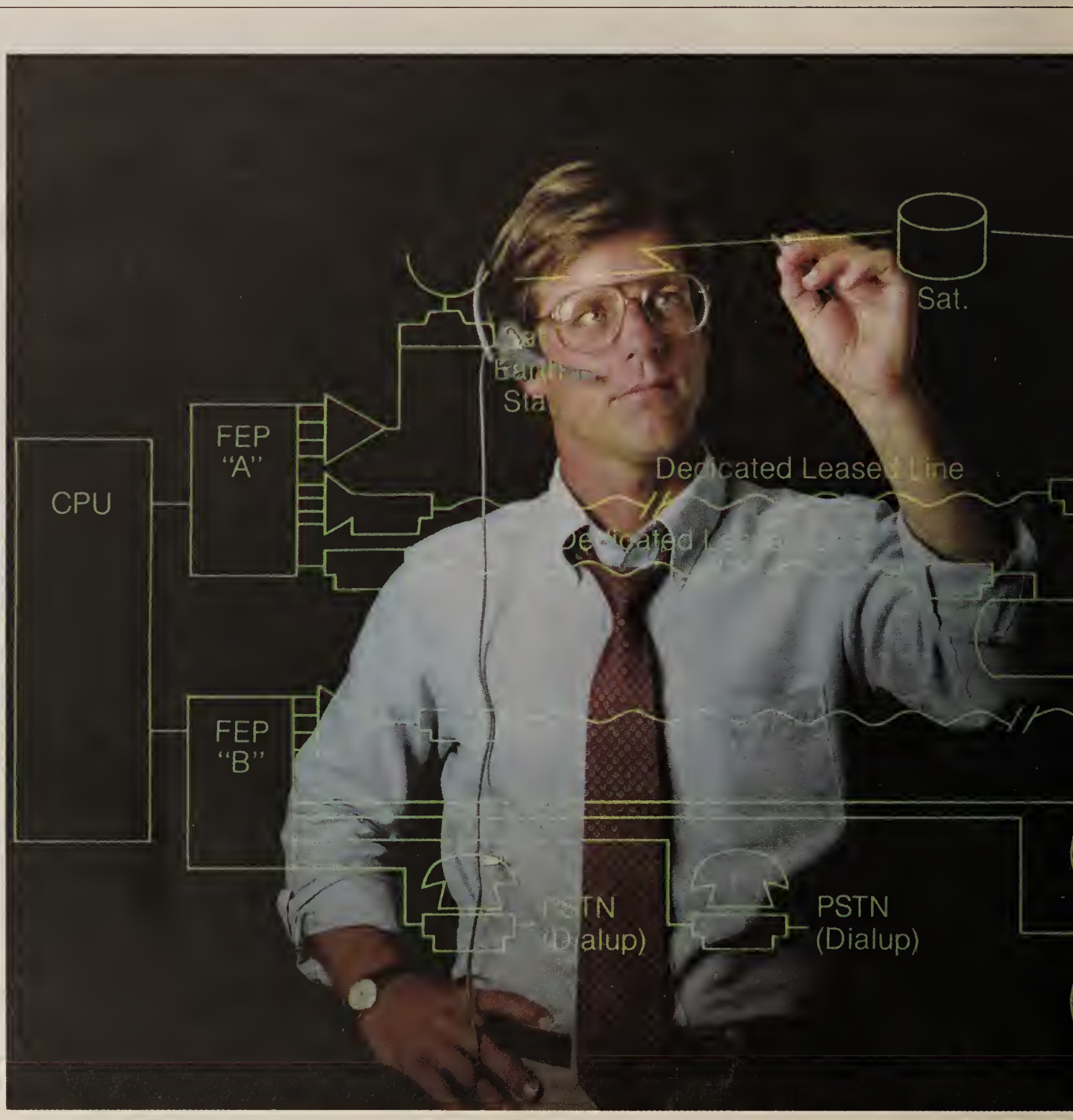
The network software is capable of handling basic transport chores, he says, but he has also had to write some specific data conversion utilities to massage data after it arrives at its destination.

Larry Robichaux, systems manager of Hart Information Systems in Austin, Texas, has also invested a considerable amount of time writing conversion programs. In his case, these programs are for the Digital Equipment Corp. VAX-11/780, which the database publishing company uses to drive its phototypesetting equipment. They are needed to convert flat database files from the company's PCs and Macintoshes into files that can be accepted by typesetting software.

Making the connection

A network connection makes it possible for these dissimilar computers to exchange information. All these machines are connected via an Appletalk network.

The PCs, which are used for text editing, some limited typesetting and as the



How Customer Support Will Keep Pace with Tomorrow's Modem Technology

Created by Dayner/Hall, Inc., Winter Park, Florida

Tittel, a field application engineer for Excelan Corp. in Austin, Texas, writes for a number of publications on networking subjects.

primary receiving stations for customer transmissions, employ Appleshare PC cards to gain access to the network's Localtalk twisted-pair network media. The VAX is hooked in with a Kinetics Fastpath Ethernet-to-Localtalk gateway. Again, however, there is a difference between getting information from Point A to Point B and getting it there in usable form.

Robichaux's tool of choice for accomplishing this transformation in exchanges between Macs and PCs is Mastersoft Inc.'s Word for Word, a word processing data conversion program that embraces a wide variety of formats for both Mac and PC word processors. When it comes to transferring information to the gateway-connected VAX, however, Robichaux is on his own.

IT DOES SEEM that where there's a will to move applications and files between dissimilar machines, users will find a way, although it may not be as straightforward as they would like.

At Schlumberger Ltd., the oil-well services and technology company, heterogeneous LANs are widespread. Each site has its own LAN, supporting a variety of engineering and office systems. These site LANs are linked through Macintoshes connected into DEC's Decnet via a gateway.

At the company's Austin Systems Center division, VAX, Sun, IBM PC and Macintosh machines all coexist on a network, thanks to Appletalk PC cards and TCP/IP. This setup shows the kinds of exchange efforts entailed in this type of situation.

Kristi Ray, a graphics coordinator, supervises the layout and production of brochures, business graphics, annual reports and a newsletter for the division. These materials all require input from a variety of networked sources. Brochure production, for example, commonly requires meshing engineering drawings from computer-aided design workstations with manuals created on the VAX as well as mathematical analyses into Aldus Corp. Pagemaker running on a Macintosh.

All the incoming data is initially deposited in a special directory on the VAX, using a terminal emulator to transfer files across the Ethernet LAN from a PC or by using a file transfer program to move the data from a Sun workstation.

Next, Ray uses Apple's Macterminal to log on to the VAX over a Localtalk network through a Kinetics Fastpath gateway to download the necessary files to the Mac.

This causes the original formatting — especially margins, tabs and other kinds of text layout information — to be replaced with an arbitrary number of blanks, Ray says. These files must then be imported into Microsoft Word and reformatted before they pass into Pagemaker.

'Just one of those things'

What would really help a lot, Ray says, are tools that would enable her to preserve formatting when doing file transfers. But "it's just one of those things you learn to live with," she says, summing up what appears to be the prevailing sentiment among most users who lack the time and skills to build their own customized file conversion applications.

It does seem that where there's a will to move applications and files between dissimilar machines, users will find a way, although it may not be as straightforward as they would like.

Hopefully, they will not have to struggle much longer. Network operating systems that include generic file formats are available with specialized file conversion for each machine the network supports. These operating systems, which do not require the data's form to change with its residence, promise to alleviate the situation. Distributed applications, which permit dissimilar computers to exchange information more transparently, offer another escape route. •

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LANs lead way to E-mail

BY NINA BURNS

Local-area networks may be the spark that is needed to touch off the long-predicted explosion in electronic mail use.

To date, E-mail use on LANs has been limited. The majority of the four million to six million people in the U.S. who now use E-mail do so with minicomputer- and mainframe-based E-mail services.

Burns is a vice-president and senior analyst at Infonetics, Inc., a LAN testing and evaluation and market research firm in Santa Clara, Calif.

More than six million people are currently connected to LANs. That number is likely to change quickly, however, and could grow to about 30 million by 1991 — a substantial market for E-mail.

LANs provide the perfect platform for widespread E-mail use within the work group and beyond. They provide support for DOS, IBM and Microsoft Corp.'s OS/2, the Apple Computer, Inc. Macintosh and Unix workstations; connectivity to minicomputer and mainframe environments; and the flexibility and user-friendliness that larger systems do not have. The challenge is to provide system solutions that meet user needs and are compatible with one another.

There are several reasons why the potential of LANs as a vehicle for E-mail has not yet been realized:

- Most E-mail systems are difficult to use.
- Typically, these products cannot communicate with one another. So, for example, users of Consumers Software, Inc.'s Network Courier cannot exchange mail with 3Com Corp.'s 3+Mail or Action Technologies, Inc.'s The Coordinator, even if both run on the same LAN.
- Integration of PCs and office systems has been limited to office systems such as Digital Equipment Corp.'s All-In-1 and IBM's Professional Office System as well as public E-mail systems such as MCI Communications Corp.'s Mail.
- LAN communication outside the work group has been rare.
- LAN E-mail packages have not supported both IBM Personal Computer and Macintosh computers.
- Until recently, LAN network operating system and application vendors did not take E-mail seriously.

The LAN vendors today are beginning to see that E-mail is a universal business productivity tool and are looking for ways to solve the incompatibility and connectivity issues slowing its growth. With the exception of IBM and Apple, all the major LAN vendors have committed to E-mail solutions this year:

- Novell, Inc.'s Netware now includes Message Handling System (MHS) from Action Technologies. Novell has also enlisted the support of major vendors such as Ashton-Tate Corp. to use MHS for their PC applications. Netware applications using MHS can send electronic messages to each other and to non-Netware applications that use MHS.
- Tops, a division of Sun Microsystems, Inc., acquired Symantec Corp.'s In Box E-mail application this year. Tops views E-mail as a strategic part of its PC networking solution and plans to integrate it with Tops products in Macintosh, DOS and Unix environments.
- 3Com was the first LAN vendor to include an E-mail offering, 3+Mail. This year, the company has enhanced 3+Mail to support Macintosh users and to provide gateways to corporate E-mail and office systems products such as All-In-1.
- Microsoft acquired Intermail from Internet Systems Corp. in 1987 and began selling it as Microsoft Mail this year. Microsoft Mail is a simple work group solution for Macintosh networks. The company is now shipping an IBM PC version and plans more substantial enhancements. Furthermore, the newest version of Microsoft Word includes electronic messaging based on Microsoft Mail.

Most LAN E-mail systems now provide E-mail connections to minicomputer and mainframe E-mail and office systems products. Other vendors such as Microsoft and Tops offer easy-to-use PC LAN work group solutions and have made substantial commitments to enhance their E-mail offerings this year and in 1989.

Based on the progress made so far, the number of E-mail users on LANs could soon easily outnumber all other E-mail users. Many issues still need to be solved, including internetwork messaging, directory services, incompatibilities between mail systems and the role of the CCITT X.400 protocol to interconnect store-and-forward messaging systems.

But thanks to LANs and their connected users, E-mail finally has the potential for becoming a real market with a growing sphere of influence in areas such as scheduling, desktop management and conversation management. •

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INTERVIEW
WHEN TO DISCIPLINE A LAN

Wylie Crawford is chairman of the board of LANDA, an association of local-area network resellers incorporated in May 1987. He is also president of Kenwood Associates, an independent LAN reseller in Chicago. Crawford spoke recently with *Computerworld* Senior Editor Joanne Kelleher about the state of network management for LANs.

When people talk about network management for LANs, what do they ordinarily mean?
Too often, when people think about a LAN, they think of it as just a wire and boards and PCs and ignore all the management issues, such as building a redundant LAN; building a safe, reliable LAN; and coordinating the activities of people who got used to being mavericks while working on single-user machines.

So most LAN users are not really looking for products to help them manage their networks.
There are people now who have larger LANs who are beginning to realize that just the task of backing up a multiserver LAN can be complicated. But there are also a lot of people who don't realize that managing a LAN may involve a lot of physical running around the building, or that they are going to grow into a LAN that is so large they won't be able to keep a mental image from day to day about what the specific hardware configuration is at each person's workstation.

Once these realities sink in and the users are told that products do exist to help them, they are easy sells.

Is there a definable point at which network management products become a real necessity?
Not really. As long as they are departmental LANs and the LAN has not become a corporatewide standard, there is less of a perceived need for management tools. If it is a large department spanning floors and multiple file servers, such tools would probably be warranted.

There really is no magic threshold. It's a weighted combination of number of people, number of servers and amount of activity.

What do you think of the general quality of the network management products you've seen?
The ones I'm familiar with are good, solid products that do what you want — sometimes even before you know you want it. Some allow you to look at what is going on on users screens from a remote location. Some let you keep a database of who the users are and what kinds of equipment they have. One I know of helps you keep track of where documents are in a multiserver, multivolume environment.

Which categories of network management products would you say are really crucial for expansion of LAN usage?
The ones that do traffic analysis are critical for performance. Obviously, if performance of the LAN doesn't keep up with user expectations, that is going to kill its growth potential. So the various monitoring products, from $20,000 on down, are really central to growth of the environment.

And what is the current availability of that kind of product?
It's pretty good. There are a number of software products, both from third parties and the LAN vendors, that allow you to have a dynamic picture on your screen of how many bytes or bits or packets are flowing in the network at any given moment.

In addition, there are hardware products that will connect to your wire and allow you to get a trail of all the traffic on the line to whatever level of detail you want in terms of reporting. Some cost as little as a couple of hundred dollars and just give you overall traffic flows so you can see where things have topped out.

How about products that will allow you to monitor applications, in the sense of knowing who is using what and being able to track overlap?
There are two products that I am aware of that will tell you when you have opened or closed or deleted or written or read any file in the network.

They give you more detailed information than just who got into which package when. They also tell you what files were opened.

If you just want log-in and log-out information, you get that automatically with Netware 2.1 and above, but it wasn't available easily early on.

Generally speaking, how difficult are most network management products to use? Do they require specialized knowledge?
The ones that demand a certain amount of knowledge are the more expensive and more exotic hardware products that track every packet, because they will give you all the various layers of OSI and let you look at all the headers and the envelopes around the packets and so on, and you have to know what you are doing down there.

Most of the products you've mentioned have been third-party products; how about what the LAN vendors are coming up with?
It depends on where you draw the line about what constitutes network management. If you consider password protection and control over stations and log-ins to be network management, Novell seems to be ahead of the pack.

It is quite clear in the latest version of Netware that they listened very carefully to the needs of MIS people, because they incorporated a whole bunch of stuff that has long been available on mainframes in terms of login restrictions and encryption of passwords and so forth. I see the same stuff coming out just now as add-on functions in LAN Manager 3+Open.

It makes a lot of sense to have this kind of capability, but I'm not quite sure whether I'd consider it a LAN management tool. It's so integral to the environment, somehow.

What is there out there that can help people who have a number of different kinds of LANs?
I haven't seen anything yet that successfully bridges, or is intended to bridge, local-area network operating systems.

Basically, once you are into one of those environments, you are into it, and the products that

Wylie Crawford

you take and use have to work in those environments. There's not any kind of software-level meta-bridge to make the differences among those various operating systems invisible. Maybe someday there will be, but it would require that all of those products basically remain stable for a period of time. And the market isn't going to see that for a while, I'm sure.

What about compatibility between network management products for the LAN and network management for larger systems' networks?
I really can't speak with any expertise on that. All I can say is that right now, most of the communication between users of LANs and mainframes is through some kind of terminal emulation, which is a low-traffic and not very intimate connection. I don't think the demand is going to increase much until you have peer relationships between PCs and mainframes. •

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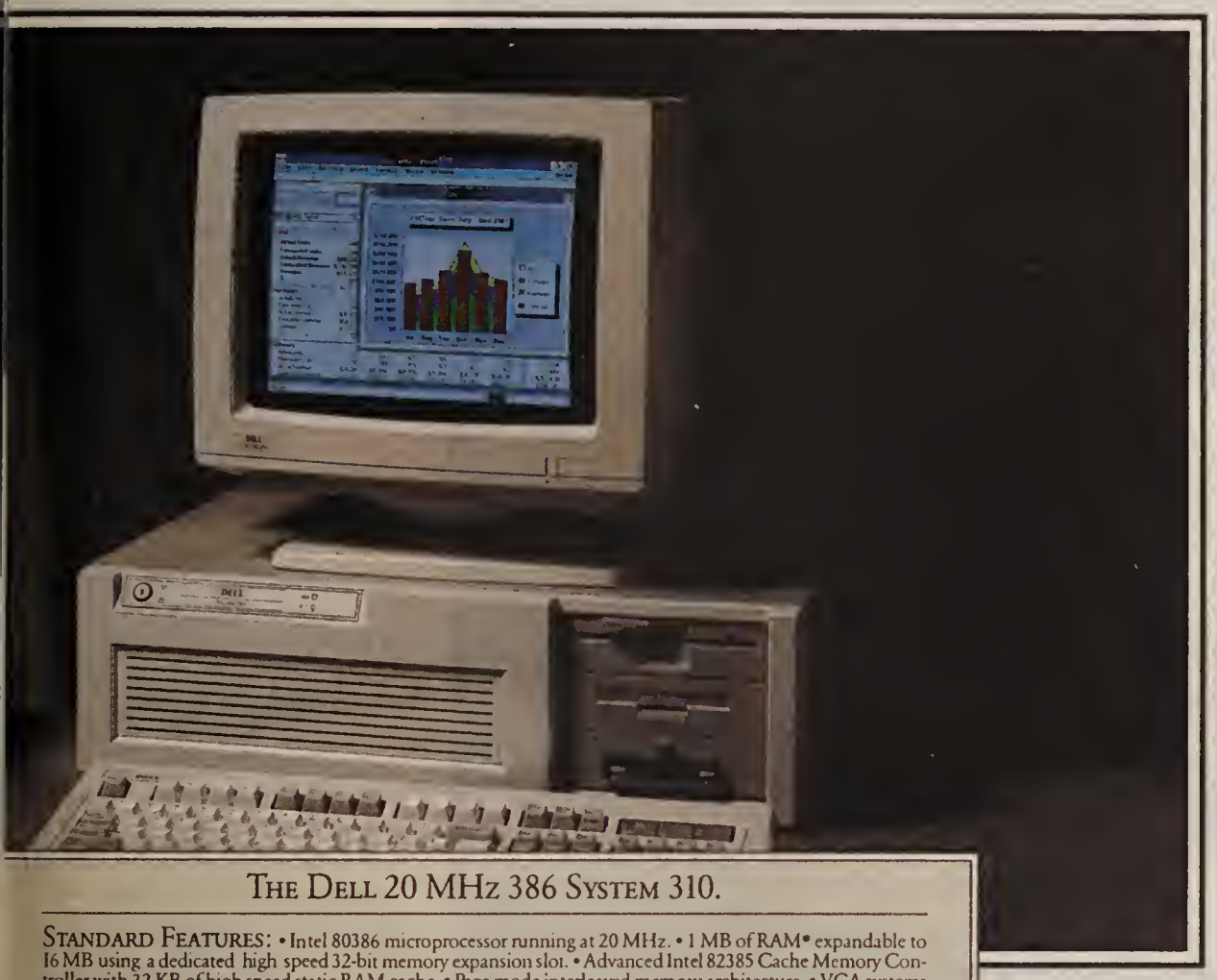

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AD CODE NO. 11H05

ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.

We use Torus' Tapestry I Version 1.46 LAN operating system and would like to know if Torus provides more APIs with Tapestry II for user-defined gateways and peer-to-peer communications. If so, do they provide on-screen examples in addition to those provided in the manuals?

Mark Hargrove
Senior Software Engineer
Lockheed Space Operations
Kennedy Space Center, Fla.

TORUS SYSTEMS, INC.: Tapestry 1.46 currently has a number of APIs to allow third-party developers to provide gateways and other applications to run in the Tapestry environment. Tapestry II has been designed to be more open than Tapestry 1.46 and will provide more APIs as it develops. In particular, it will be much easier to integrate a third-party Netbios gateway into a Tapestry II environment.

In addition, Tapestry II has been developed to incorporate industry-standard protocols and APIs. For example, the Netbios API will always be available in a Tapestry II environment for peer-to-peer communications. Tapestry II can also be run in a Microsoft LAN Manager environment in which Named Pipes and other LAN Manager APIs may be utilized.

The University of Illinois has several Proteon Pronet-80 rings. We're interested in Proteon, Inc.'s plans for its Fiber Distributed Data Interface (FDDI). What will the transition to the FDDI products entail?

Sue Greenberg
Associate Director
of Computer Services
University of Illinois
Urbana, Ill.

PROTEON, INC.: Proteon is committed to a smooth migration path to FDDI. This migration is facilitated because many of Pronet-80's physical specifications have been adopted by FDDI. For example, both Pronet-80 and FDDI use 62.5-micron fiber. This means that your Pronet-80 cable plant investment, which can often be as much as 30% of the total network cost, will be preserved.

To migrate from Pronet-80 to FDDI, users will need to upgrade the existing fiber-optic module and swap their Pronet-80 components for the FDDI equivalent. Pronet-80 users who choose to migrate to FDDI will get a credit for doing so.

Will Tops release versions of its networking software that will support the Apple Filing Protocol (AFP)? If so, will Tops also become Appleshare-compatible?

Sean McCarthy
Owner
Computers and
Communications
McKinonville, Calif.

TOPS: Every networking application that currently runs over Appleshare will also run over Tops. The two networks have two essential elements in common: The lower layers of the Appletalk and Ethertalk protocols and the standard file system that is an integral part of every Macintosh.

Tops and Appleshare diverge beneath the file systems level. Tops uses the Tops Filing Protocol rather than Apple Filing Protocol. The session protocols, which handle various transactions between a client and a server on the network, are also different.

Tops uses its Softtalk protocol, while Appleshare uses the Appletalk Session Protocol. A few network applications may still need to address these protocols. But even here, we believe Tops represents the best way to maintain machine and network independence. •

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DBMS packages for LANs

COMPANY	PRODUCT	MINIMUM MEMORY REQUIRED (BYTES)	WORKS WITH WHICH NETWORK OPERATING SYSTEMS	PERMITS SIMULTANEOUS DATABASE UPDATES	TYPES OF USER INTERFACES	RUNS ON SERVER	PERMITS CONCURRENT BROWSING	SQL SUPPORT	PROVIDES DATA DISTRIBUTION SUPPORT FOR LAN OR WAN	PROGRAMMING LANGUAGES SUPPORTED	FULL DATA TRANSFER WITH WHICH OTHER SOFTWARE	MAXIMUM FIELD SIZE	MAXIMUM NUMBER OF FIELDS PER RECORD/RECORDS PER FILE	AUTOMATIC RECOVERY	AUTOMATIC FILE LOCKING	AUTOMATIC RECORD LOCKING	PRICE
Acius, Inc. (408) 252-4444	4th Dimension	700K	Appleshare, Tops	Dependent on networking software	Menus	Yes	Yes	No	No	Pascal	Sylk, DIF, ASCII files	32,000 characters	99/16 million+	Yes	No	Yes	$695
Admins, Inc. (617) 494-5100	Admins/ V32	4M	Decnet	Yes	Menus, windows, commands	Optional	Yes	No	LAN and WAN distribution queries and updates	Any 3GL	ASCII files	80 characters	200/Limited by disk space only	Yes	Yes	Yes	$16,000 and up
Advanced Microsolutions (415) 365-9880	DBmagic	1M	NP	NP	Menus, windows, commands	Yes	No	ANSI standard	LAN distribution queries	Basic	Proprietary software	50 characters	50/Limited by disk space only	Yes	Yes	Yes	$1,495
American Planning Corp. (703) 751-2574	B.O.S.S.	512K	Netbios-compatible networks	Network dependent	Menus, windows, commands	No	Yes	No	LAN, WAN distribution queries and updates	Basic, assembler	ASCII files	255 characters	255/Limited by disk space	Yes	Yes	Yes	$990-$1,895
Ashton-Tate Corp. (213) 329-8000	Dbase IV	640K	Novell Advanced Netware, Ungermann-Bass, 3Com 3+, IBM PC LAN, IBM Token-Ring	Network dependent	Commands, query by example, 4GL	No	Yes	ANSI, IBM SAA	No	C	DIF, ASCII files, Lotus 1-2-3	4,000 bytes	255/1 billion	Yes	Yes	Yes	$695-$1,295
Asksam Systems (800) 327-5726	Asksam Version 4.1	256K	Advanced Netware, 3+	No	Menus, commands	No	Yes	No	No	Proprietary	ASCII files	1,600 bytes	Limited by disk space only	No	Yes	No	$895 (for 10 users)
Borland International, Inc. (408)438-8400	Paradox (Various versions available)	640K-3M	Advanced Netware, 3+, Torus Tapestry; IBM Token-Ring, PC LAN; DOS 3.1-compatible	Yes	Menus	No	Yes	No	LAN distribution queries and updates	Paradox Application Language	NP	255 characters	255/2 billion	No	Yes	Yes	$725-$995
Britton Lee, Inc. (408) 378-7000	Share Base I & II (Must have Britton Lee server to use)	640K	Decnet, TCP/IP, XNS, 3+	Yes	Menus, forms, command	Yes	Yes	ANSI, Addendum	LAN distribution queries and updates	C, Cobol, Fortran	Dbase, Lotus, PFS files	255 characters	250/2 billion	Yes	Yes	Yes	$20,000-$125,000
Business Tools, Inc. (206) 644-2015	TAS-Professional 3.0	512K	Any Netbios-compatible	Limited only by hardware	Menus, commands	Optional	No	No	LAN and WAN distribution queries and updates	Proprietary	ASCII files	255 characters	255/4 billion	Yes	Yes	Yes	$499 (single-user)-$699 (multiuser)
Campus America, Inc. (615) 523-9506	Poise DMS-Plus	2M	Decnet	Yes	Menus, commands	No	Yes	No	LAN and WAN distribution queries and updates	VAX/VMS native languages	ASCII files	2,047 characters	511/16.7 million	No	Yes	Yes	$19,500-$29,000
Chang Laboratories, Inc. (408) 246-8020	C.A.T.	1M	Appletalk	Dependent on size on network	Menus, windows	No	Yes	No	LAN distribution queries	Excel	Any spreadsheet supported on the Macintosh	65,000 characters	8,000+/ Limited by disk space only	No	Yes	Yes	$399.95
Cognos, Inc. (508) 535-7350	Powerhouse Starbase	512K	Decnet, TCP/IP	Yes	Power 4GL	Yes	Yes	ANSI	LAN and WAN distribution queries and updates	C, Cobol, Pascal, Basic, Fortran, Ada	20/20, DB2, IMS, VSAM, DIF, WKS, RMS, RDB files	32,000 characters	16,000/ Limited by disk space only	Yes	Yes	Yes	$2,500-$100,000
Compuserv Data Technologies (617) 661-9440	System 1032 4GL/DBMS	2M	VAX/VMS	Yes	Menus, windows, commands	No	Yes	No	No	Any	SAS, SPSS, 1-2-3, 20/20	65,535 bytes	32,000/2 billion	Yes	Yes	Yes	$3,000-$180,000
Computer Control Systems, Inc. (904) 752-0912	DB-FABS/ DABL	384K	Any Netbios-compatible	Dependent on network	Windows, commands	No	Yes	No	LAN distribution queries and updates	Basic, Pascal, C, Fortran	Dbase II, DIF files	255 bytes	128/4.2 billion	No	Yes	Yes	$395
Compuware Corp. (313) 737-7600	Powerbase	384K	Novell Netware; IBM PC LAN, Token-Ring	Yes	Menus, commands	Yes	Yes	No	LAN distribution updates	None	Word-perfect, Micropro International Word-star	80 characters	64/65,000	No	Yes	Yes	$495
Data Access Corp. (305) 238-0012	Dataflex	384K	All DOS-compatible	Yes	Menus, windows, commands	Yes	Yes	No	LAN, WAN distribution queries and updates	Proprietary, C	Dbase, ASCII files	255 characters	255/16.6 million	No	Yes	No	$1,250-$1,650
Database Applications, Inc. (609) 924-2900	NPL/R	350K (640K recommended)	Netware, IBM Token-Ring	Yes	Commands	No	No	Proprietary	No	Proprietary	Dbase, ASCII files	999 characters	256/Limited by disk space only	Yes	Yes	No	$595 (single-user)-$995 (multiuser)

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

COMPANY	PRODUCT	MINIMUM MEMORY REQUIRED (BYTES)	WORKS WITH WHICH NETWORK OPERATING SYSTEMS	PERMITS SIMULTANEOUS DATABASE UPDATES	TYPES OF USER INTERFACES	RUNS ON SERVER	PERMITS CONCURRENT BROWSING	SQL SUPPORT	PROVIDES DATA DISTRIBUTION SUPPORT FOR LAN OR WAN	PROGRAMMING LANGUAGES SUPPORTED	FULL DATA TRANSFER WITH WHICH OTHER SOFTWARE	MAXIMUM FIELD SIZE	MAXIMUM NUMBER OF FIELDS PER RECORD/RECORDS PER FILE	AUTOMATIC RECOVERY	AUTOMATIC FILE LOCKING	AUTOMATIC RECORD LOCKING	PRICE
Dataease International, Inc. (800) 243-5123, (203) 374-8000 (in Conn.)	Dataease LAN	640K	Netware, IBM Token-Ring, 3+, Banyan Vines, AT&T Starlan	Yes	Menus, windows, commands	Yes	Yes	No	No	Proprietary	Lotus 1-2-3, Symphony; Multimate, Word-perfect, Mailmerge, ASCII files, DIF files, Dbase II, III	255 characters	255/65,000	No	Yes	Yes	$700 (server copy), $750 (workstation packs)
Dayflo Software Corp. (714) 474-2901	Dayflo Tracker	384K	Netware, 3+, IBM Token-Ring, Vines	Yes	Menus	Yes	Yes	No	No	Proprietary	ASCII files	32,000 characters	1,000/ 65,000	No	Yes	No	$149.95
Dimension Software Systems, Inc. (214) 580-1045	Freeform (must have Britton Lee Shared Database to use)	512K	Ungermann-Bass, Ethernet	Yes	Menus, commands	Yes	Yes	Proprie-tary	LAN distribution queries and updates	C	ASCII files	255 characters	2,000/ Limited by disk space only	Yes	Yes	No	$53,000
Empress Software (301) 953-0049	Empress	640K	NFS, RFS, Decnet, Opennet, Vaxcluster	Yes	Menus, commands	Optional	Yes	ANSI	LAN, WAN distribution queries and updates	C, Fortran, Proprietary	No	Limited by disk	9,999/ limited by disk	Yes	Yes	Yes	$1,400-$1,750
Expert-Ease Systems, Inc. (415) 593-3200	Ease Plus Graphical DBMS/ Interface	540K	Ethernet	No	Menus, windows, commands, Icons, diagrams	No	Yes	No	No	C, Fortran, Basic	Autocad	64,000 characters	200/ 100,000+	No	No	No	$685-$3,800
Finder Information Tools, Inc. (404) 872-3488	Finder: The Retrieval Software	256K	Netware, CBIS, Token-Ring	Yes	Menus	No	Yes	No	LAN and WAN distribution queries	None	ASCII files	255 characters (text fields unlimited)	50/Limited by disk space only	No	No	No	$695
1st Desk Systems, Inc. (800) 522-2286	1st Team	512K	Tops, Appleshare	Yes	Windows, menus	No	Yes	No	LAN, WAN distribution queries	NP	All with 1st Port	255 characters	255/2 billion	NP	Yes	No	$795
Goldata Computer Services, Inc. (800) 432-3267	Goldatabase	192K	Advanced Netware	Yes	Menus, Commands	Yes	Yes	No	LAN and WAN distribution queries and updates	Basic	ASCII files, DIF files	800 bytes	300/Limited by disk space only	No	Yes	Yes	$495
Gupta Technologies, Inc. (800) 876-3267	SQL Base	640K	All Netbios-compatible	Yes	Windows, Presenta-tion Manager	Yes	Yes	IBM DB2	LAN distribution queries and updates	SQL Windows, C, Cobol, Cobol Precompiler	ASCII files	5000 characters	250/Limited by disk space	Yes	Yes	Yes	$1,295
Henco Software (617) 890-8670	Info-DB	1M	Decnet	Yes	Menus, commands, windows, forms	No	Yes	No	WAN distribution queries	Info, Intuitive Query Language	Info, Mass-11, any RMS data, Workmarc Composer	4,096 characters	10,000/ unlimited	No	Yes	Yes	$7,500-$165,000
Hewlett-Packard Co. Contact local sales office	Allbase/SQL	2.7M	None	Yes	Menus, commands	Yes	Yes	ANSI Level 1	LAN, WAN distribution queries and updates	Cobol, Fortran, Pascal, C, Allbase/4GL	Allbase/Net	3,996 characters	255/limited by disk space	Yes	Yes	No	$3,150-$36,700
IBM Contact local sales office	OS/2 Extended Edition Data Base Manager	NP	OS/2 Extended Edition	NP	Menus, commands, panels	Yes	Yes	IBM SQL	NP	C, Pascal, Cobol	Enabled Applications	32,700 long variable character	255/limited by disk space	Yes	Yes	Yes	NP
Information Builders, Inc. (212) 736-4433	PC/Focus-Multiuser	495K for work-station, 475K for server	IBM Token-Ring, PC Network; Advanced Netware, Nestar, Vines, AT&T Starlan	Yes	Menus, windows, commands	Yes	NP	ANSI	LAN and WAN distribution queries and updates	C, Fortran, Pascal, Cobol	Information Builders' Focus	4,096 bytes	256/Limited by disk space only	No	No	No	$1,195-$4,000
Information Dimensions, Inc. (800) 328-2648 (614) 761-7300	DM	1M	NP	Yes	Commands, menus	Yes	Yes	No	NP	Fortran, Cobol	NP	15,000 characters	500/2 billion	Yes	Yes	Yes	$15,000 and up
Information Resources, Inc. (617) 890-1100	PC Express	640K	IBM Token-Ring, Netware, 3+	No	Menus, windows, commands	Yes	Yes	No	LAN distribution queries	Proprietary	DIF, ASCII files, 1-2-3	Limited by disk space	Limited by disk space only	Yes	Yes	No	$1,495
Informix Software, Inc. (415)322-4100	Informix 4GL, Informix-SQL, Informix-ESQL/C	640K	Netware, 3+, IBM PC LAN, Starlan, TCP/IP, Decnet, MS-Net compatible	Yes	Menus, windows, commands	Yes	Yes	ANSI	No	C	1-2-3, WKS and WKI files, DBase III	32,000 characters	Limited by disk space	No	Yes	Yes	$1,495-$2,495
Inmagic, Inc. (617) 661-8124	Inmagic	384K	Advanced Netware, 3+, any that support DOS 3 file-locking protocols	No	Menus, commands	No	Yes	No	No	None	ASCII files	Limited by disk	75/Limited by disk	No	Yes	No	$2,350 and up
Inter Systems, Inc. (312) 480-9270	SIR/DBMS	640K	Advanced Netware	Yes	Menus	No	Yes	ANSI	LAN, WAN distribution queries and updates	Cobol, Fortran, Basic, Pl1	ASCII files, SAS, SPSS, BMDP	4,096 characters	4,0965/ limited by disk space	No	Yes	Yes	$4,000 and up

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Interactive Technology, Inc. (503) 644-0111, (800) 362-6203	RDM: The Application Developer	512K	3Com 3Share, Netware, Decnet	Yes	Menus, commands	No	Yes	No	LAN and WAN distribution queries and updates	NP	RMS, ASCII files	255 characters	220/16 million +	No	Yes	Yes	$895-$89,995
Interbase Software Corp. (617) 275-3222	Interbase	Operating system dependent	Apollo Domain, Vaxcluster	Network dependent	Menus, commands, graphics	Optional	Yes	Proprietary	LAN, WAN distribution queries and updates	Ada, Basic, C, Cobol, Fortran, Pascal, PL1	RDB	32,000 characters	16,000/ limited by disk space	Yes	Yes	Yes	$5,000-$75,000
IOTC, Inc. (307) 721-5818	PDbase	256K	Unicom Software Omninet	Yes	Menus, commands	Yes	Yes	No	LAN queries and updates	Proprietary	DIF files	32,763 characters	16,300/ Limited by disk space only	No	Yes	Yes	$695
Landmark Software Systems, Inc. (201) 722-5100	Xample	256K	Decnet	Limited by hardware only	Menus	Yes	Yes	No	LAN and WAN distribution queries	Cobol, C, assembler	RMS files	132 characters	Limited by disk space only	Yes	Yes	Yes	$20,000-$75,000
Lanquest Group (408) 727-9446	Datastore: LAN	300K	Netware, Vines, all Netbios-compatible	Yes	Menus	Yes	Yes	No	No	C, Pascal, Basic	1-2-3, Wordstar, Mailmerge	80 bytes	512/Limited by disk space only	No	Yes	Yes	$1,195 (first five users), $495 (each additional five users)
Macon Systems, Inc. (719) 520-1555	Advanced DB Master	512K	Netware, The Software Link Multilink Advanced, Knowledge Network, PC-DOS	Yes	Menus	Yes	Yes	No	LAN and WAN distribution queries and updates	None	1-2-3, Dbase, Multiplan, ASCII files	250 characters	250/ 250,000	Yes	Yes	Yes	$1,600
MAI Basic Four (714) 731-5100	MAI Origin Application Development System	256K	BOSS/VS, BOSS/IX	Yes	Menus	No	Yes	No	LAN and WAN distribution queries and updates	Business Basic	Proprietary software	32,767 bytes	Limited by disk space only	No	Yes	Yes	$1,495-$5,995
Metafile Information Systems, Inc. (800) META 4GL	Metaview	365K; 250K (with EMS)	DOS share-compatible	Limited by hardware	Menus	No	Yes	No	LAN distribution queries and updates	Proprietary	NP	1,000 characters	500/2 million	No	Yes	Yes	$1,995 (workbench), $495 (XOS delivery system)
Micro Business Applications (800) 431-1416	PHD Relational Database	128K	Netware, Alloy	Yes	Commands	Yes	Yes	No	No	Cobol	ASCII files	99 characters	Limited by disk space only	No	Yes	Yes	$495
Micro Data Base Systems, Inc. (800)344-5832	MDBS III	256K	Advanced Netware, IBM Token-Ring, 3+	Yes	Menus, commands	Yes	Yes	ANSI	NP	C, Pascal, Fortran, Cobol, Knowledge-man/2, Guru	Knowledge-man, Guru	65,535 characters	32,767/- Limited by space	Yes	Yes	Yes	$7,000
	Knowledge-man/2	512K	Advanced Netware, IBM Token-Ring, 3+, Nestar	Yes	Menus, commands, custom interfaces	Yes	Yes	ANSI	LAN distribution queries	Knowledge-man, C, Guru	Guru, 1-2-3	65,534	255/1 billion plus	No	Yes	Yes	$1,995
Microrim, Inc. (206) 885-2000	R:Base	512K (single user), 640K (multi-user)	3+, Advanced Netware, Vines; IBM PC Network, PC LAN	Yes	Menus, commands	No	Yes	ANSI standard	LAN and WAN distribution queries and updates	C, Fortran, Pascal	NP	4,092 characters	400/2.5G bytes	No	Yes	Yes	$725-$2,695
Microsoft Corp. (800) 443-4672	Ashton-Tate/ Microsoft SQL Server	6M	LAN Manager, LAN Server, 3Com 3+, LAN Manager-compatible	Limited only by memory	Windows	Yes	Yes	ANSI	LAN distribution updates	C, Cobol	Dbase, Ansa Software Paradox, Microsoft Excel, 1-2-3	2K-2G bytes	250/limited by disk space	Yes	Yes	Yes	$1,995
Miller Microcomputer Services (508) 653-6136	Data-handler-Plus	128K	NP	No	Keyboard commands	No	No	No	No	Fast Feedback Technologies, Inc. Forth	None	255 characters	255/Limited by disk space	No	No	No	$1,300
Odesta Corp. (312) 498-5615	Double Helix II Multiuser	1M	Localtalk/Mac OS	Yes	Menus, windows, commands	Yes	Yes	No	LAN distribution queries and updates	Double Helix II	ASCII files, DIF, SYLK files	Limited by disk space only	Limited by disk space only	Yes	Yes	Yes	$395
	Helix VMX	1M	Localtalk/Mac OS	Yes	Menus, windows, commands	Yes	Yes	No	LAN distribution queries and updates	Double Helix II	ASCII files, DIF, SYLK files	Limited by disk space	Limited by disk space	Yes	Yes	Yes	$4500 and up
On-Line Software International, Inc. (800) 642-0177	Ramis/PC Workstations for LANs	640K	IBM Token-Ring, PC LAN; Vines, Advanced Netware 286, DOS 3.1-compatible	Yes	Menus, windows, command, 4GL query	No	Yes	No	LAN, WAN distribution queries	Proprietary	Lotus, Dbase, DIF, Sequential, ASCII files	4K bytes	255 /limited by disk space	Yes	Yes	Yes	$2,000-$4,000
Oracle Corp. (800) 345-DBMS	Oracle Server	640K for workstation, 2M for server	3+, 3+Open, IBM PC LAN, TCP/IP, Advanced Netware, Vines	Yes	NP	Yes	Yes	ANSI	LAN and WAN distribution queries and updates	C, Fortran, Cobol	NP	Limited by disk space	255/NP	Yes	Yes	Yes	$1,999 per server and up
Paperback Software (415) 644-2116	VP-Info	384K	Netware, IBM PC Network	Yes	Commands	Yes	No	No	No	Proprietary	Dbase, ASCII files	256 characters	256/64,000	No	Yes	Yes	$124.95
Parameter Driven Software (313) 540-4460	PDS-Adept PC LAN	640K	Advanced Netware	Yes	Menus, commands, windows	Yes	Yes	No	NP	Pascal, C	DIF, Sylk, ASCII files	80 characters	Limited by disk space only	No	Yes	Yes	NP
PC Manager, Inc. (703) 356-4600	Dataedge 1.7N	384K	DOS 3.1-compatible	Yes	Menus	No	Yes	No	No	Proprietary	ASCII files, Dbase II, III, III Plus	254 characters	500/limited by disk space	No	Yes	Yes	$595

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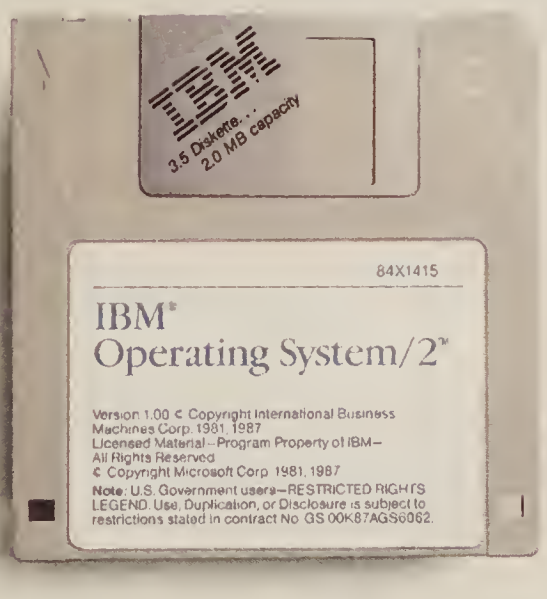

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PRODUCT SPOTLIGHT

COMPANY	PRODUCT	MINIMUM MEMORY REQUIRED (BYTES)	WORKS WITH WHICH NETWORK OPERATING SYSTEMS	PERMITS SIMULTANEOUS DATABASE UPDATES	TYPES OF USER INTERFACES	RUNS ON SERVER	PERMITS CONCURRENT BROWSING	SQL SUPPORT	PROVIDES DATA DISTRIBUTION SUPPORT FOR LAN OR WAN	PROGRAMMING LANGUAGES SUPPORTED	FULL DATA TRANSFER WITH WHICH OTHER SOFTWARE	MAXIMUM FIELD SIZE	MAXIMUM NUMBER OF FIELDS PER RECORD/RECORDS PER FILE	AUTOMATIC RECOVERY	AUTOMATIC FILE LOCKING	AUTOMATIC RECORD LOCKING	PRICE
Probase Group, Inc. (714) 535-2833	Probase	192K	3+, Ethernet	Yes	Menus, commands	Yes	Yes	No	No	Proprietary	Dbase, ASCII files	64 characters	64/65000	Yes	Yes	Yes	$295
Raima Corp. (206) 747-5570	DB Vista III	60K	Netbios-compatible	Yes	None with package	No	Yes	IBM DB2	LAN and WAN distribution queries	C	ASCII files, DIF, 1-2-3, Dbase	Limited by disk space only	32,767/ 16,777,215	Yes	No	No	$695-$1,495
Realty Microsystems, Inc. (416) 641-1882	Real Estate Software	384K	Netware	Yes	Menus, windows	Both	Yes	No	LAN and WAN distribution queries and updates	Proprietary	NP	79 characters	250/Limited by disk space only	Yes	Yes	Yes	$1,695-$5,500
Revelation Technologies, Inc. (212) 689-1000	Advanced Revelation	512K	Advanced Netware, 3+, Vines, AT&T Starlan, IBM PC LAN	Yes	Windows, menus, commands	No	Yes	No	LAN distribution queries and updates	R/Basic, assembler, C	1-2-3, Dbase III, ASCII files	64K bytes	32,000/ Limited by disk space only	No	Yes	Yes	$950
Sature Systems,Inc. (612) 944-2452	Saturn-Base	640K	3Com 3+	Yes	Menus, forms	Yes	Yes	No	LAN distribution queries and updates	Pascal	ASCII files	255 bytes	255/NP	No	Yes	Yes	$1,495-$3,495
Smith Abbott & Co. (301) 561-8411	Autopro	640K	Netware	Yes	Menus	Yes	Yes	No	NP	DEC's Dibol	Word-perfect	80 characters	Limited by disk space only	No	Yes	Yes	$750
Software Products International (619) 450-1526	Open Access II Plus Network Database	320K	Advanced Netware, 3+; IBM PC Network, Token-Ring; Vines, Netbios-compatible	Yes	Menus, windows	No	Yes	No	LAN distribution queries and updates	Proprietary	Lotus, Dbase, ASCII files, DIF	78 characters	100/2.2 billion	No	Yes	Yes	$895-$4,995
Software Publishing Co. (415) 962-8910	Professional LAN Pack	512K	3+, Netware, Tandy Vianet; IBM Token-Ring, PC Network	Yes	NP	Yes	Yes	No	NP	NP	NP	1,680 characters	3,200/ 60,000	Yes	Yes	No	$499
Star Software, Inc. (800) 242-7827	DB Partner	256K	Advanced Netware	No	Menus	Yes	Yes	No	LAN and WAN distribution queries and updates	Basic	ASCII files	256 characters	999/ 9,000,000	No	No	No	$195
Sybase, Inc. (415) 596-3400	Sybase	3M	Decnet, Unix, TCP/IP	NP	Menus, windows, commands	Yes	Yes	ANSI	LAN and WAN distribution queries and updates	C, Fortran, Cobol, Ada, Pascal	ASCII files	4G bytes	250/Limited by disk space only	Yes	Yes	Yes	$100,000
Symantec Corp. (408) 253-9600	Q&A	512K, 640K for work-station	All that support PC-DOS, MS-DOS, OS/2	NP	Menus	No	Yes	No	No	None	NP	1,670 characters	2,182/16 million	Yes	Yes	Yes	$349
Teradata Corp. (213) 827-8777	DBC/1012	512K	Excelan, TCP/IP, ISO/OSI	Yes	Interfaces to standard access tools	Yes	Yes	ANSI	LAN distribution queries and updates	Cobol, C, Fortran, Assembler	PC SQL Link	32K bytes	256/limited by disk space	Yes	Yes	Yes	$160,000
The Small Computer Company, Inc. (914) 269-3160	Filepro Plus	512K	Advanced Netware, 3+, PC Network, all Netbios compatible	Yes	Menus	No	Yes	NP	LAN distribution queries and updates	None	ASCII, DIF, Sylk files	999 characters	999/16 million	No	Yes	Yes	$995-$1,495
The Software Group (518) 877-8600	Enable/OA	512K (640K recom-mend-ed)	NP	Yes	Menus, windows, commands	Yes	Yes	No	LAN distribution queries and updates	Basic, C, Pascal, proprietary	Condor Computer Condor3, PC File, Dbase	254 (text), 16 (integer)	254/Limited by disk space only	No	Yes	Yes	$695 (single user); $450 per workstation
Unify Corp. (916)920-9092	Unify 2000	256K	DOS	Yes	Menus, windows	Yes	Yes	ANSI Level 1	No	C	ASCII files	Unlimited	Unlimited	Yes	Yes	Yes	Varies by platform
Unlimited Processing, Inc. (904) 731-8330	Team-Up 2.1	140K	Netware, 3+, Vines, Cluster Link, PC Network, CBIS Network OS, Computer Pathways Grapevine	Yes	Menus, windows	Yes	Yes	No	LAN or WAN distribution queries and updates	C	None	1,900 characters	1,000/4 billion	Yes	Yes	Yes	$795 and up
VI Systems, Inc. (800) 633-6587	VIS/TPS	2M	TCP/IP, Ethernet	Yes	Menus	No	Yes	No	LAN, WAN distribution queries and updates	Cobol, C	VIS/TPS communica-tion products	Limited by disk space	NA	Yes	Yes	Yes	NP
Wordperfect Corp. (801) 225-5000	Dataperfect	192K	3+, Netware, Token-Ring	Yes	Menus, windows	Yes	Yes	No	NP	None	Word-perfect, Planperfect	32K bytes	80/80	Yes	No	No	$595
Wordtech Systems, Inc. (415) 254-0900	DBXL/LAN	40K	Any DOS 3.1-compatible	Yes	Menus, windows	No	Yes	No	LAN distribution queries and updates	Dbase	Lotus 1-2-3	254 characters	128/1 billion	No	Yes	Yes	$599
Zanthe Information, Inc. (613) 727-1397	Zim	640K	Advanced Netware	Yes	Menus, windows, commands	No	Yes	ANSI	NP	Zanthe Zim PL1	DIF file formats	32K bytes	NP	Yes	Yes	Yes	$1,600-$84,000
Zylab Corp. (312) 632-1100	Zyindex 3.0	448K	Advanced Netware, 3+, Vines, IBM Token-Ring	No	Menus, windows, commands	Yes	Yes	No	NP	None	ASCII files	Limited by disk space only	Limited by disk space only	Yes	Yes	Yes	$95-$695

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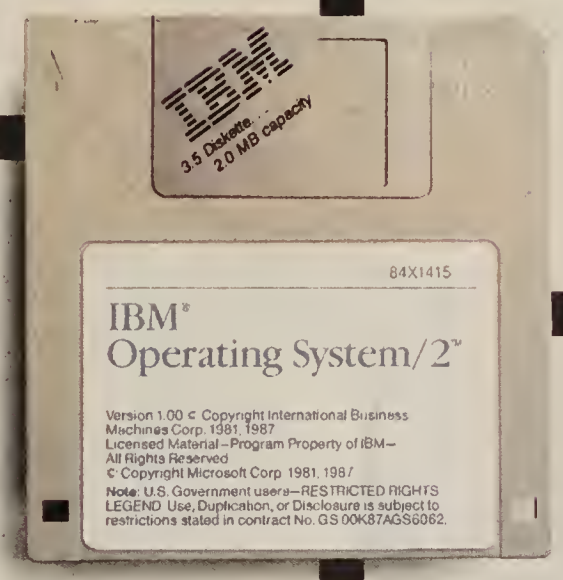

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Is your PC software running wild?

Bringing package tracking under control can save you time and money

BY IRV BROWNSTEIN

Your lack of a PC software inventory could be costing you thousands, if not hundreds of thousands, of dollars a year.

Preposterous statement? Not true in your shop?

Maybe. But the odds are great that if you don't keep track of your software packages and tools and you are a Fortune 500 company with thousands of personal computers, your budget will be hit hard by the absence of an inventory. Even installations that have from 100 to 200 PCs can benefit from an improved PC software management scheme.

For example, Richard Welsh, supervisor of the information center at the Great Lakes Division of National Steel Corp. in Ecorse, Mich., points out, "As a result of annual [PC software] reviews, we generally deinstall approximately $15,000 worth of [unused] software that we can then use for future users."

With various inventory and control products, he adds, "We were able to maintain the same staff size managing PC resources despite our growth from 10 PCs to currently over 170 PCs."

What are the problems with tracking PC software? Software is usually sought and acquired for its contribution to improved productivity. But as the number of people and areas using PC-based packaged software in an organization grows, the system often becomes unproductive, usually because of one or a combination of the following reasons:

- There may be a lack of awareness that a particular software package exists or that it has already been evaluated and acquired by some other group within the firm.
- There may be redundant reviews of the same software being done in inconsistent ways by different groups within the company.
- Software may be bypassed without consideration if it has been reviewed and rejected. And it may have been rejected only because it failed to meet one group's requirements, which were unrelated to another group's needs.
- There may be a lack of knowledge that familiarity and expertise with a given software package is available in the company.

It is also likely that packages that are acquired and found wanting for one set of requirements are left sitting on the shelf — perhaps overlooked for other, more useful purposes elsewhere in the organization.

In a typical company, many project teams review a large

JUDY FILIPPO

Brownstein is a New York-based consultant specializing in quality assurance. He has authored several articles on productivity as well as *Guidelines for Evaluating and Selecting Software Packages* (Elsevier, 1982).

• Five steps to healthy software management

• Buy or build an inventory database

• Do perfectly good products sit on the shelf?

Keeping track

A software and tool survey such as the one below can help MIS control its PC software inventory

Title of package:_____ Acronym:_____

Date acquired:_____ Version:_____ Release level:_____

Tool category:
_____ Requirements _____ Maintenance _____ Quality measurement
_____ Design _____ Support _____ Project management
_____ Code _____ Performance measurement
_____ Testing _____ Other — Describe _____

Abstract/Functional description:_____

Developer/Vendor company:_____ Contact:_____
Address:_____ Location:_____
Telephone:_____

Acquisition basis:
_____ Evaluation _____ Shareware
_____ Workstation component _____ Free trial _____ No evaluation
_____ In use for_____years _____ In use by_____firms _____ No support
_____ Monthly lease: $_____ _____ Purchase price: $_____ _____ Site license
_____ Public domain _____ Other:_____

Availability/Restrictions/Considerations:_____

Hardware: _____ Mainframe _____ Mini _____ Micro

Manufacturer/model:_____

Operating system:_____ Level:_____

Resources required: Memory_____ Peripherals_____ Other_____

Source language(s): Cobol _____ C _____ Basic _____ HLL _____ Other _____

Documentation: Location _____
_____ Software evaluation _____ Technical paper
_____ User manual _____ Maintenance manual
_____ Test/Plan procedure _____ Full documentation

Comments:_____

CW CHART

quantity of PC software packages. Most of this information remains in personal files and in the undocumented experiences of individual team members.

Thus, anarchy in your software package management could easily represent money in the vendors' pockets. A PC software package inventory will improve information exchange as well as save time and money.

What's the gain?

Implementing a software reference service can increase staff efficiency, make better use of purchased and reviewed software and reduce redundant software evaluations. And for those in MIS who want the control, you will have provided a foundation for PC hardware and component tracking, consistent purchasing and inventory control.

More specifically, the work involved in setting up the inventory will provide these other gains:

- It will produce an accurate overall inventory of all PC software development and maintenance tools. The listing could be expanded to include all environments — mainframe, minicomputer and micro — although this often already exists in some form for the mainframe.
- It will help determine tools that should be purged.
- It will help define opportunities for tool sharing or transfer that will result in direct dollar savings.
- It will identify those tools that are not fully leveraged within the company, along with the critical factors necessary for complete, high-impact rollout.
- It will help quantify the penetration of each tool in terms of its use in applicable situations by the appropriate staff.
- It will identify gaps in the life cycle coverage.

There are many ways to maintain central control over PC resources. Great Lakes Steel does it through Welsh and the information center. Welsh implements outside products such as PC Tracker from RG Software Systems, Inc. for inventory control and Direct Access from Delta Technology International, Inc. to identify the utilization of software on each PC. The center staff also performs periodic inventory control checks or reviews to determine instances of unused or underutilized software.

Before getting too far in the implementation of a tracking program, you should make some specific decisions. You need to simply determine who does what when.

In Great Lakes Steel's case, such decisions were made somewhat easily. The division's policy is to implement only PC software obtained by the information center. As part of that rule, the information center directs all purchases through the purchasing department. Welsh's group then maintains a rigorous inventory — which is checked every six months — of all hardware to the component level and all software to the release level.

In any case, MIS should put some person or group in charge. It may be the information center manager, a PC support group or a department responsible for productivity. After such a decision is made, there are five broad steps you can take to establish a working PC software package inventory:

Step 1. Determine the content of the inventory database.

In addition to existing software, will the database contain existing software package evaluations and provide an equipment inventory to the component level?

Gathering software package evaluations provides a way of discovering what software has been evaluated for what purpose and with what result. Generally speaking, however, it does not make sense to go back for historical evaluations.

At a minimum, for existing software, the inventory database should contain the name of the software, including any acronym; the type of software and life cycle phase(s) used; a brief summary of the features, functions and any pertinent experience in use and benefits; a list of processes and features available; the name of the developer if internal or the vendor if external; the dates of installation and the last upgrade; the development language used; the hardware manufacturer and models; and the operating system and any specialized software necessary for use.

In addition, the database should include the release level and date; the types of available documentation; the group that supports the software within the organization; any restrictions on the product's availability, such as copyrights and licenses; the names of contact people, typically those internal to the organization, to whom you can turn for more information about the software; and a brief description of how the software was acquired.

> THERE MUST be a consistent basis for evaluating software packages in order to successfully use the inventory database.

Step 2. Identify a method for getting consistent software evaluations.

There must be a consistent basis for evaluating software in order to successfully use the inventory database. It is necessary to have a common body of knowledge from which all staff members can draw, although the detailed evaluation need not be included in the database — especially if, for example, it is published in a three-ring binder. The database would then include a summary of the evaluation, stating where it is physically located.

Common rating factors for software evaluation address functional, design, cost, vendor and support issues:

- Functional requirements. Does the package meet the user's business needs?

These parameters are determined by a detailed review and evaluation of the basic functionality incorporated in the software package to determine its application suitability, controls and security features, operational and capacity performance capabilities and its contribution to improved

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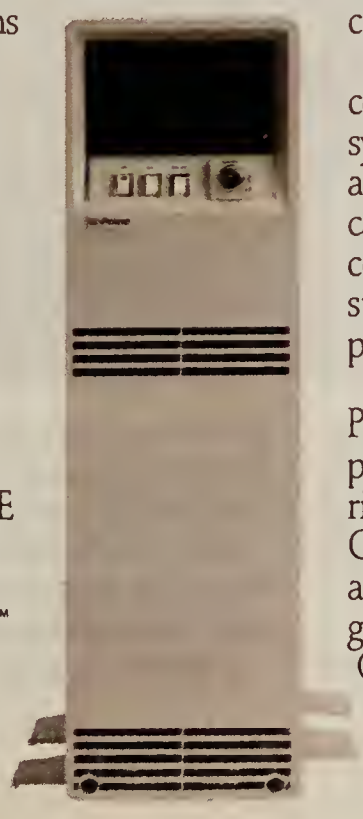

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• Design concepts. How does it do what it does, and is that OK?

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• Costs. Are the indirect as well as direct costs acceptable?

Determine the software package's direct costs, such as the base price, options and contractual obligations. Also determine the indirect costs incurred for package or tool installation — in both personnel and machine time — maintenance, additional training, additional support, modifications and enhancements, operational production processing and any auxiliary equipment or software that must be used.

• Vendor. Do you have any prior dealings with the vendor to guide you?

This factor is supported, where appropriate, by a detailed review and evaluation of the vendor's stability and reliability in terms of its financial background, its commitment to standing behind the product and any prior dealings you may have had with the firm; the knowledge and experience of the vendor's management, sales and technical personnel; and the package's marketability in terms of availability, extent of use, testimonials and so on.

• Support. Do you get anything in addition to the software, and is the additional support any good?

To get a handle on support, evaluate documentation and procedures, training materials and support for user and operations personnel; the materials, training, procedures and commitment — such as provision for emergency maintenance — to support software package maintenance; and the acceptance materials, on-site support and procedures for installation.

PC MANAGERS with an extensive array of software to inventory will need a common taxonomy or keyword basis for storing and retrieving related software package reviews.

Step 3. Define the standard software package terminology for using the inventory.

PC managers with an extensive array of software to inventory will need a common taxonomy or keyword basis for storing and retrieving related software package reviews.

One approach is the process authored by the National Bureau of Standards — now the National Institute of Standards and Technology (NIST) — and used by the General Services Administration to define each software package according to its features in a hierarchical fashion.

The NIST, in a publication written by Raymond C. Houghton Jr., provides a useful way to identify tools or software packages. In this approach, the software package is categorized by the basic processes and feature types within each process

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The basic processes include input, function and output. The feature types include subject, control input, transformation, static analysis, dynamic analysis and machine output. Each package in the database is then tagged for retrieval using the applicable processes and feature types.

Keep in mind that the objective is software sharing. Don't overcomplicate the process — particularly at the start, or if the number of potential software packages in the inventory seems to be limited.

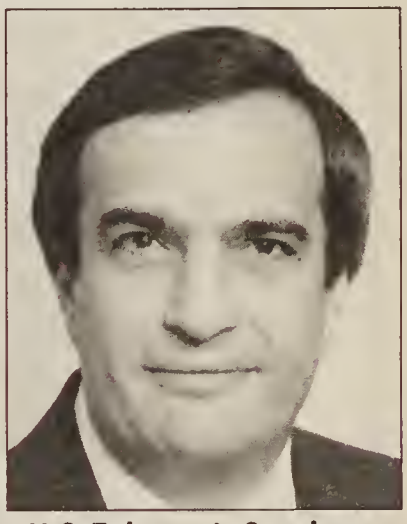
Step 4. Determine and acquire — or build — the software tool or tools to be used.

Whichever approach you use, there are several tools available to assist you in this step. For starters, there are many database and retrieval tools, such as Borland International's Reflex and Ashton-Tate Corp.'s Dbase, that can be successfully applied to this work.

And for those looking for more comprehensive products, in addition to PC Tracker, Micro Resource Manager, from Computer Associates, Inc. (formerly Atrium Information Group, Inc.), comes in a variety of flavors and capabilities to manage your inventory. According to the vendor, Micro Resource Manager will be followed early next year by a new product called CA-Advisor, which, it is said, will help evaluate situations and help you navigate through software applications problems. Another product that tracks, controls and electronically distributes is Sofstore from DTSS, Inc.

Whether buying or building, start off easy. The tool should address the existing PC software package inventory, run on a PC and be accessible either through a PC local-area network or another form of disk distribution and provide retrieval with limited update capability.

Later, features could be added to evaluate software utilization, automate the evaluation input and update facility, tie in to external databases containing software evaluations or tie in to external bulletin boards like Sofsearch and Compuserve.



U.S. Tobacco's Stephens

This process will help evaluate your tools themselves through regular use. Ultimately, your tools can be used more extensively or replaced with more comprehensive software.

Step 5. Survey the PC community to collect and enter data.

To get started, you'll have to establish the initial inventory. In this process, you should locate and define the current inventory of software packages, and at the same time, determine their level of penetration or use. The form shown on page 102 — with modifications — can be used as part of a detailed questionnaire or as an interview checklist to establish the inventory. The extent of use or penetration can then be determined either by surveying the information systems community using the completed inventory or by way of a software

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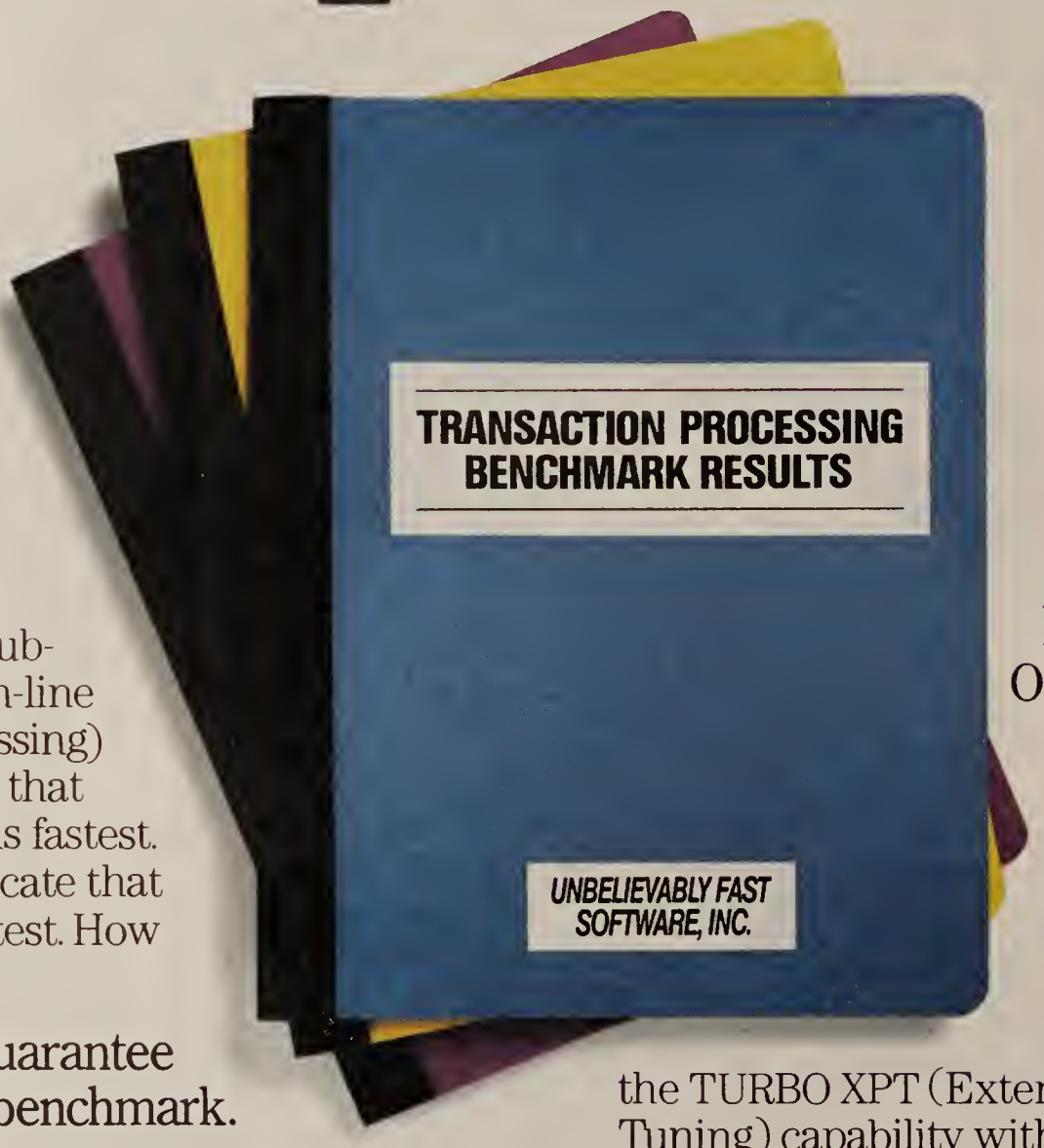

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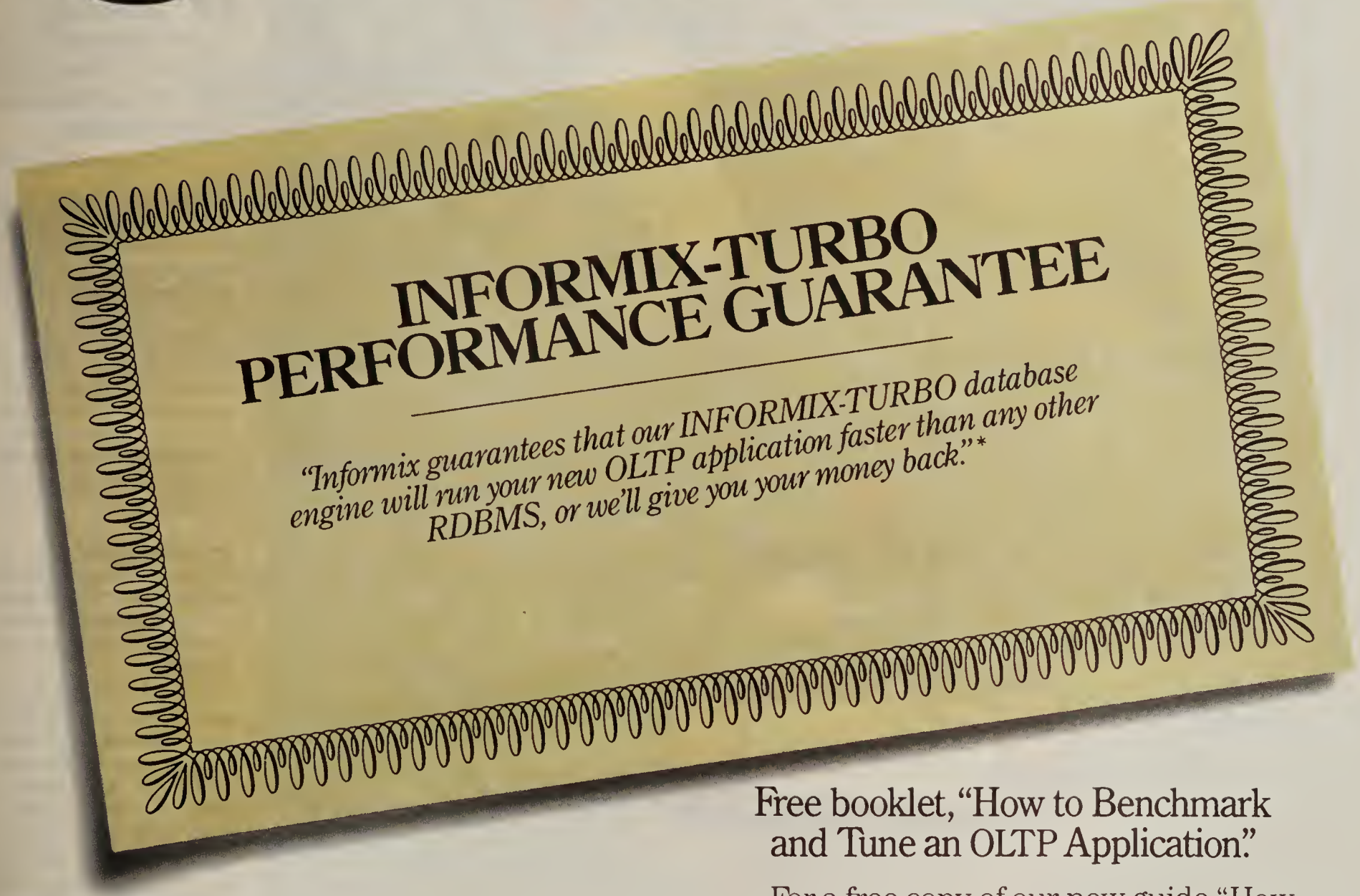

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product such as one of those mentioned above.

The most accurate approach to take when completing an inventory is on a machine-by-machine basis. One way to achieve this level of detail, and still keep costs down, is to use a part-time employee such as a summer intern. Richard Stephens, manager of office systems at U.S. Tobacco Co. in Greenwich, Conn., uses Micro Resource Manager and says that he employed a summer intern over a one- to two-month period to complete a physical inventory of 150 of the company's PCs.

Sites with more personal computers — and thus more software — will need more time to complete their inventory. At Manufacturer's Hanover Trust Co. in New York, Yvonne Parle, a technical support manager who also uses Micro Resource Manager, explains that her group's inventory averaged 10 to 15 line items per workstation including boards, peripherals and software.

Establishing the inventory of 1,500 to 2,000 personal computers was a long process; it took about 10 months of work, Parle says.

In addition to the direct dollar savings noted earlier in moving unused software at Great Lakes Steel, Parle at Manufacturer's Hanover says she is hoping to be able to globally identify the users whose software — and hardware — is due to be upgraded. This program allows her to implement the upgrades more easily.

Somewhat similar to Great Lakes Steel's case, Parle has discovered that, as the user base at Manufacturer's Hanover increased, the level of administrative support staff that her company required decreased.

However, there is no such thing as a free lunch. If there is, it's generally not very good. Most of the real impact of a software package inventory is accrued over time and with more control over software package evaluations and the PC resources.

Analysis of the information gathered in the inventory can reveal the existing level of support for each development life cycle phase and provide the opportunities to address gaps in that coverage.

JUST HAVING an inventory is not enough. More important is being able to keep the inventory accurate on an ongoing basis.

With the utilization of simple monitoring tools, the extent of software package use can also be determined. This information can then be integrated with project information to improve development and maintenance productivity.

Essential updates

But just having an inventory is not enough. Perhaps more important is being able to keep the inventory accurate on an ongoing basis.

According to Ray Uriarte, an account executive at Manchester Equipment Co., a large distributor of personal computers, peripherals and software in Hauppauge, N.Y., "The bigger users of 2,500 to 3,000 PCs don't necessarily want to commit someone to the inventory. The difficulty is keeping the inventory up to date."

Manchester Equipment used to provide a service designed to help customers manage their inventories. However, it decided to drop that program when cooperation from individuals within the companies waned.

"We kept the inventory for about 100 companies, but it became unwieldy," Uriarte says. "When clients would call about a component and we responded, we would find that it was often on another machine at the client site."

By taking control of tracking the microcomputer software inventory in your company, you can achieve significant cost savings and provide improved service to your PC users and customers. However, it is somewhat like working a gold mine — you have to dig a little to see results. •

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TAKING CHARGE

Anthony Reed

Spicing up status reports

Every week, MIS professionals reluctantly submit project status reports to their managers. Unfortunately, the reports lack the substance and structure managers need to make decisions.

Programmers perceive the report process as a weekly ritual that provides them few benefits. Managers see the status reports as their lifeblood; they make decisions based on this information. However, some managers become so frustrated with low-quality reports that they find themselves supplementing the reports by praticing MBWA — Managing by Wandering Around.

Many MIS professionals hate to write anything other than programs. The general assumption is, "If we wanted to write reports, we would have majored in business, English or journalism." They think the time spent writing a report would be better spent completing a Cobol program or solving a production problem. The resistance to writing has led to a lack-

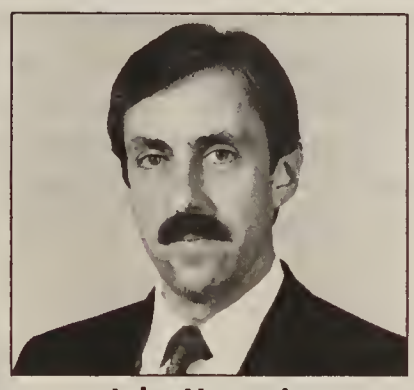
Continued on page 118

Hammitt faces new challenge

BY JAMES CONNOLLY
CW STAFF

HARTFORD, Conn. — Move from the top MIS job at one Fortune 500 company to a comparable post at a company that is almost three times the size and what is the first challenge?

"Trying to find my way around" is the quick, somewhat facetious answer from John Hammitt, who two months ago moved from The Pillsbury Co. to United Technologies Corp., based here, as vice-president for information systems.



John Hammitt

Hammitt knows what he wants to accomplish as chief information officer of United Technologies — parent company of units such as Otis, Carrier and Pratt & Whitney. However, he also knows that it will take some time for him to learn enough about the company to make the moves he wants to make.

"The first few months on a job are clearly focused on understanding the businesses: Who are the key players? What are some of their significant issues, in business as well as in their use of information technology? You can think of at least three, or more likely six, months as a learning experience. I'm not adding value so much as absorbing the scope and breadth and complexity of United Technologies," he says.

One of the things Hammitt hopes to accomplish in the long run is to transform the 30-member corporate information systems group from a passive, coordinative role into what Hammitt calls an "integrative role." The group will drive the more than 4,000 IS employees in the diverse, independent business groups to share information and experiences. Hammitt's title

Continued on page 114

Young gun matures at TV MIS department

BY RICHARD PASTORE
CW STAFF

George Grippo is the first to admit he seems an unlikely MIS captain. He calls his career history a sordid tale. "The fact is, 4½ years ago, I was a radio disk jockey," he says.

The 26-year-old manager of information systems says he has found his niche and come of age in the small MIS shop at Secaucus, N.J.'s WWOR-TV, Inc., one of three independent stations in the New York area — which is the nation's No. 1 television market. The technical background he brought consisted of personal computing experience from two jobs as a teenager.

On his circuitous career path to MIS, Grippo spun tunes in clubs on the Jersey Shore. He quit when he "got tired of dodging beer bottles." Radio seemed a safer way to continue playing music, have fun and communicate with the public, Grippo says, so he went to C. W. Post University in Brookville, N.Y., to pursue it.

"It looked like just a great thing to do," he recalls. "Playing on the radio four or five hours a day and getting paid enormous sums of money was exactly what I wanted."

Grippo got his foot in the door

Continued on page 117

PROFILE

George Grippo

JOHN GIORDANO/PICTURE GROUP

Position: *Manager of information systems, WWOR-TV, Inc.*
Philosophy: *"Whether you have the resources or not, when you're given a job, you find a way to do it or take the blame if you can't."*

Quality assurance field growing rapidly

BY ALAN J. RYAN
CW STAFF

ORLANDO, Fla. — Quality assurance, once the realm of manufacturing environments, has become a growing force within MIS departments in all industries of late.

According to a poll of 128 organizations that have quality assurance positions within their MIS departments, salaries within the new field are continuing to rise, but MIS quality assurance education is difficult to find.

The survey, conducted by the Quality Assurance Institute, Inc. (QAI), found that systems analysts are more likely than other MIS personnel to move into the quality assurance field.

The prime purpose of the quality assurance position is to improve the processes within information systems — to develop, test and maintain the systems. "They're really the people that put in the methodologies, fine-tune them and approve them," said William E. Perry, executive director of QAI. Other titles they sometimes assume are that of development center manager or standards manager.

Getting more respect

Companies are putting more emphasis on and attaching higher salaries to quality assurance, Perry said. However, the survey also found that the typical quality assurance manager has a background in computer science, has worked as a systems analyst and has acquired little quality assurance training.

"Schools don't train these people, and you can't put an ad in the newspaper to hire them," Perry said. But the field continues to grow. The expected growth rate for the post is 26% for 1989, Perry said. "That represents five straight years of a growth rate of over 25%."

Five years ago, the top salary for the quality assurance job was approximately $50,000, he said. In April, the survey found that the highest pay in companies surveyed was $120,000. The average pay was $52,200 for a quality assurance manager, $41,700 for a senior quality assurance staff person and $32,700 for a junior staff person.

Some skills Perry said many quality assurance managers lack are trend analysis, regression analysis and the ability to create cause-and-effect charts.

Perry said that for the most part, a person who accepts a quality assurance job will learn his skills on the job. The most frequent activity respondents said they had been involved with during the past year was attending outside seminars to further their skills in quality assurance.

The tools most frequently used by quality assurance groups are standards, training, reviews, communication skills and common sense, the study found.

Nearly all of the companies that have the quality assurance position also have information systems groups containing more than 50 people, Perry said.

New field

Most of the companies surveyed said the quality assurance function had been established during the past two years, with only 18% saying they have recognized the function for more than five years. About 40% of the respondents said the quality assurance staff accounts for less than 1% of the total systems development and programming professional staff, and an additional 43% said they did not expect the size of that staff to change during the next year.

Achievements of the quality assurance groups during the past year included creating an awareness of quality, stopping poor-quality systems from going into production, implementing problem reporting and conducting training programs, respondents said. Impediments facing the function include difficulty in obtaining top management commitment and involvement, being understaffed and underbudgeted, high expectations from upper management and the fact that the department is viewed as a police function by other departments.

Goals include improving the process of testing and getting the needed training for quality assurance personnel. Those surveyed said that to fulfill these missions they need how-to-do-it guides, measurement programs, testing tools, quality education training and software inspection and review processes.

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Hammitt

CONTINUED FROM PAGE 111

and role are new for United Technologies, he says in comparing his position with that of predecessors such as John Bennett, who held the top United Technologies IS post until two years ago.

"My role is much more one of active involvement with the businesses and encouraging the coming together, the sharing of strengths of our businesses, so that we can take advantage of what we have built in each one of the businesses," he says.

Hammitt says he expects to consolidate some of United Technologies' existing IS councils to better focus the participation of the numerous IS executives within the business units. One role of such councils working with Hammitt will be to set standards, although Hammitt notes that United Technologies' investments throughout the years already have set many standards for the company, such as IBM mainframes for host processing; IBM and compatible personal computers for the managers' desks; Digital Equipment Corp. processors for engineering and manufacturing applications; and vendor offerings such as those from Hewlett-Packard Co. and Cullinet Software, Inc. in situations where they meet the needs that IBM and DEC cannot address.

However, the primary purposes of the IS councils, Hammitt says, will be to encourage teamwork and ensure that business units such as Otis Elevator and Pratt & Whitney can benefit from each others' experiences.

A sharing strategy

"In the past, we rewarded and encouraged behavior within each one of the business systems groups that had their loyalty measured solely by how well they contributed to that business. Now we are saying that in addition to that, you also have to look more strongly at what kind of synergy and what kind of opportunity there is for sharing," Hammitt notes. He emphasizes that the sharing strategy will not force the average IS workers to change the way they do their jobs but that top IS executives in the business units will be asked to "become part of the larger community" and that the corporate IS staff must adopt a more active role.

A second type of council that Hammitt plans to add is an external advisory board made up of outsiders such as consultants, academicians and IS executives from noncompeting companies. Hammitt envisions that panel as a body that can review United Technologies' IS moves to help keep the company's plans realistic.

In discussing what he hopes to accomplish in his new job, Hammitt readily contrasts his situation with the one he faced when he joined Pillsbury five years ago and began rebuilding an IS operation that he says had atrophied.

"The challenge at Pillsbury was to first build up the IS organization and capability, get the talent and leadership in place so that it could play a stronger role and then align those new folks with the key players in the businesses," Hammitt says. "At United Technologies, we have a very strong foundation already in place. The technical depth is here, and we have a number of strong leaders in the IS arena. We have a foundation to build on, and with the talent already in place, we expect to be able to move pretty agressively."

CALENDAR

DEC. 11-17

National EDI Systems Conference and Exhibit. Washington, D.C., Dec. 13-14 — Contact: J. L. Dreyer, TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

CMG '88 internotional Conference. Dallas, Dec. 13-16 — Contact: General Chairman, CMG '88, CMG Headquarters, 6397 Little River Tnpk., Alexandria, Va. 22312.

Retail Delivery Systems Conference. Nashville, Dec. 11-14 — Contact: Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

Winter Simulotion Conference. San Diego, Dec. 12-14 — Contact: Peter Haigh, NCR Corp., SER Building, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

1988 Winter Nationol Design Engineering Show. Anaheim, Calif., Dec. 13-15 — Contact: Show Manager, Winter National Design Engineering Show, 999 Summer St., Stamford, Conn. 06905.

Globol Networking: A New World of informotion. New York, Dec. 15-16 — Contact: The Yankee Group, 200 Portland St., Boston, Mass. 02114.

JAN. 1-7

1989 Society for Computer Simulotion Western Multiconference. San Diego, Jan. 4-6 — Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JAN. 8-14

Enterprise T-1 Networks: Emerging Strategies. Washington, D.C., Jan. 9-10 — Contact: Telecom Publishing Group, Attn: Conference Registrar, P.O. Box 1455, Alexandria, Va. 22313.

Automated Clearinghouse Services In Government Seminar. Arlington, Va., Jan. 11 — Contact: NACHA, Suite 640, 1901 L St. N.W., Washington, D.C. 20036.

JAN. 15-21

Notional Retail Merchonts Associotion Annual Convention and Business & Equipment Exposition. New York, N.Y., Jan. 15-18 — Contact: NRMA, 100 W. 31st St., New York, N.Y. 10001.

PTC '89, Conference of the Pacific Telecommunications Council. Honolulu, Jan. 15-18 — Contact: Pacific Telecommunications Council, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

Computer Grophics New York. New York, Jan. 17-19 — Contact: Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

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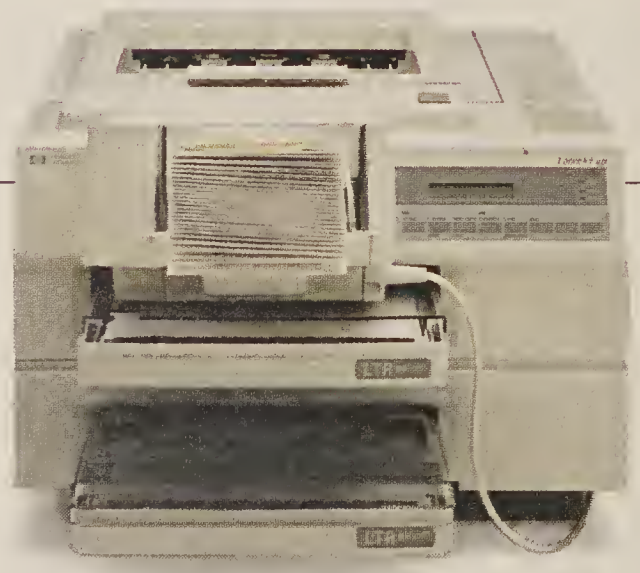

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HEWLETT PACKARD

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Young gun

CONTINUED FROM PAGE 111

in 1985 at radio and television company RKO General, Inc., which owned WWOR at the time. But he was never to get on the air; he was shanghaied into the accounts payable department when the company discovered his PC background. He transferred from the New York headquarters to WWOR the following year.

As the station's only experienced micro user, Grippo had the task of implementing a modest PC system from scratch. From there he quickly moved up to become accounts receivable supervisor and then data processing manager.

"I got a lot of promotions by default," Grippo says, "but always on condition that I would get the job done. I've said to those hiring me, 'Give me six months. If I can't get the job done, then you can let me go and there are no hard feelings.' "

Grippo says that throughout his career, he has approached difficult projects with the straight-shooting philosophy of "Show it to me once, I'll know it and I'll get it done again and again."

Sold out

In early 1987, RKO General sold WWOR to MCA Broadcasting, a subsidiary of entertainment conglomerate MCA, Inc. Suddenly WWOR was deprived of its link to RKO General's host IBM System/36, and the station and Grippo were without an MIS department.

Grippo knew MCA Broadcasting intended to fill the void with a new, in-house MIS department, and he saw the chance to make his mark. He approached WWOR business manager Cam Pardo: "I said to him, 'You can't lose with me — I'm cheap and I promise to get the job done.' "

Pardo saw the logic and tapped Grippo as MIS chief. He acknowledges that "it looked like a crapshoot, but I saw it as a safe bet to go with George. I knew his management style and potential," as well as his success with difficult projects.

For his latest endeavor, Grippo had to build a department and an information system from virtually nothing, learning as he went. In the span of six months, he installed an IBM System/38 and packaged software, including accounts payable, general ledger, payroll, order entry and word processing applications. At the same time, 20 IBM Personal System/2 Model 50s and 60s and a half-dozen Grippo-built IBM-compatible clones went on-line.

MCA Broadcasting Senior Vice-President Michael Alexander says Grippo "has the ability to deal with computers from the level of physical maintenance and repair to helping users understand sophisticated software."

The user base at WWOR has grown from less than a dozen employees to about 50 and continues to expand. The System/38 has been upgraded to support 32 terminals, and Grippo expects to attach 10 to 20 more terminals next year. And his staff has expanded by 200% — from one person to three, including himself.

Grippo will need still more help if WWOR becomes a flagship for a fleet of MCA Broadcasting stations. "I see DP here as the hub for MCA satellite stations," he says, although thus far WWOR is MCA Broadcasting's only TV outlet.

For now, MCA Broadcasting is concentrating on improving WWOR and making a run at its rival metropolitan New York stations. Under RKO General, WWOR had a less-than-sterling image, being noted for running old, schlocky movies and tired reruns, Grippo says. With an infusion of MCA capital, the station has been transformed, boosting the quality of its news division and producing more original programming, he notes.

WWOR-TV's Grippo

Despite the blossoming fortunes of his company and his personal achievements, Grippo is nettled by the handicap his youthfulness imposes.

"People don't believe me," he says. "I walk into a meeting and say something I know to be fact, and they'll say 'Come on, maybe you're overreacting; you're only 26.' " As Grippo has proven himself, his credibility has mounted, though not fast enough to suit his aggressive nature. "If I had gray hair and a limp, maybe they'd say, 'Sure, look at him. He's got gray hair; he must know what he's doing,' " he jokes.

Grippo's greatest motivations are the day-to-day pressure of his job and a new family: "This place is a powderkeg. We're television; we're 24 hours a day. I'm used to getting calls at 2 a.m."

He credits his wife Linda and 15-month-old son Alex with motivating him to achieve goals that he previously was "in no hurry" to attain.

Grippo also credits his father for "cursing" him with the work ethic. "He was one of those guys at the high executive level, and he'd come home and tell us the pressure stories," he recounts. "I swore at the time I would never let this happen to me. I thought the first time I'd have to fire somebody, I'd be in tears. Now I realize there are things in me I thought would never be there, things that just automatically click."

It's all part of growing up, he says. "I remember my father always telling me, 'You're irresponsible; grow up!' Now he says I'm so responsible, it scares him."

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adaisical attitude toward the status report. MIS workers write the report just to get it out of way, not to convey the actual project status. The reports contain either too much fluff or not enough facts. Thus, the project manager is likely to make decisions based on incomplete, difficult-to-read reports.

The ideal status report

Project managers want status reports that are structured, short, informative and easy to read. The ideal report consists of five separate sections: Problems Identified, Problems Outstanding, Problems Resolved, Accomplishments/Activities and Plans for Next Week. The first three sections are used to track problems, the fourth shows recent activities and the last identifies goals. A report should not exceed two pages.

The Problems Identified section highlights new difficulties that inhibited the programmer's progress during that week. It includes everything from slow system response time and lack of technical support to uncooperative users and lack of documentation. This section brings immediate attention to the problems at hand. If possible, a person can also document the amount of lost time associated with the trouble.

If a problem is not resolved by the next status report, it is moved to the Problems Outstanding section. All problems in this section contain the date that they appeared in the Problems Identified section. The person can continue to document lost time in this section. Thus, the manager is continually aware of unresolved difficulties and can develop action plans. If a problem remains unresolved for a long time and appears not to have a negative impact as originally thought, it can be dropped from this section.

Once the snag is resolved, the solution is documented in the Problems Resolved section and deleted from the others. Should this problem reoccur, the staff can use the reports to review their original solution.

The Accomplishments/Activities section appears next in the report. It contains information about programming activities, meetings, training, sick leave and vacation. A programmer can indicate the amount of time spent for each activity and use this as an activity time sheet. This is an excellent monitoring tool for the programmer and manager.

The last section, Plans for Next Week, forces the report writer to plan ahead and gives the manager a chance to prioritize activities. When programmers identify plans, they should list them by priority. If priorities vary, the manager can take corrective action before the next week begins.

This report format allows upward consolidation. A manager can take information from various programmers' reports and merge them into the corresponding sections of the manager's own status reports, including the programmer's name as a reference source. If the reports were generated with a word processor, the report may require minimal typing.

Language counts

Just because a status report contains the correct sections doesn't mean it is informative. Programming staffers need to learn how to convey their thoughts concisely. Instead of writing paragraphs for each report section, the programmer should limit each remark to one or two no-nonsense sentences. The more wordy the report, the more likely it will be misread — or not read at all.

This problem is resolved by using the "So what?" or "Who cares?" tests. After writing a statement, the programmer asks one of these questions and tries to determine whether that statement would cause the reader to react. A statement that doesn't cause a reaction is not worth including. The statements that usually cause reactions involve time and money. For example, if a programmer is working with an uncooperative user, he can write, "John didn't show up for our scheduled meeting again." A manager can read this problem and interpret it as unimportant because it failed the manager's "So What?" test.

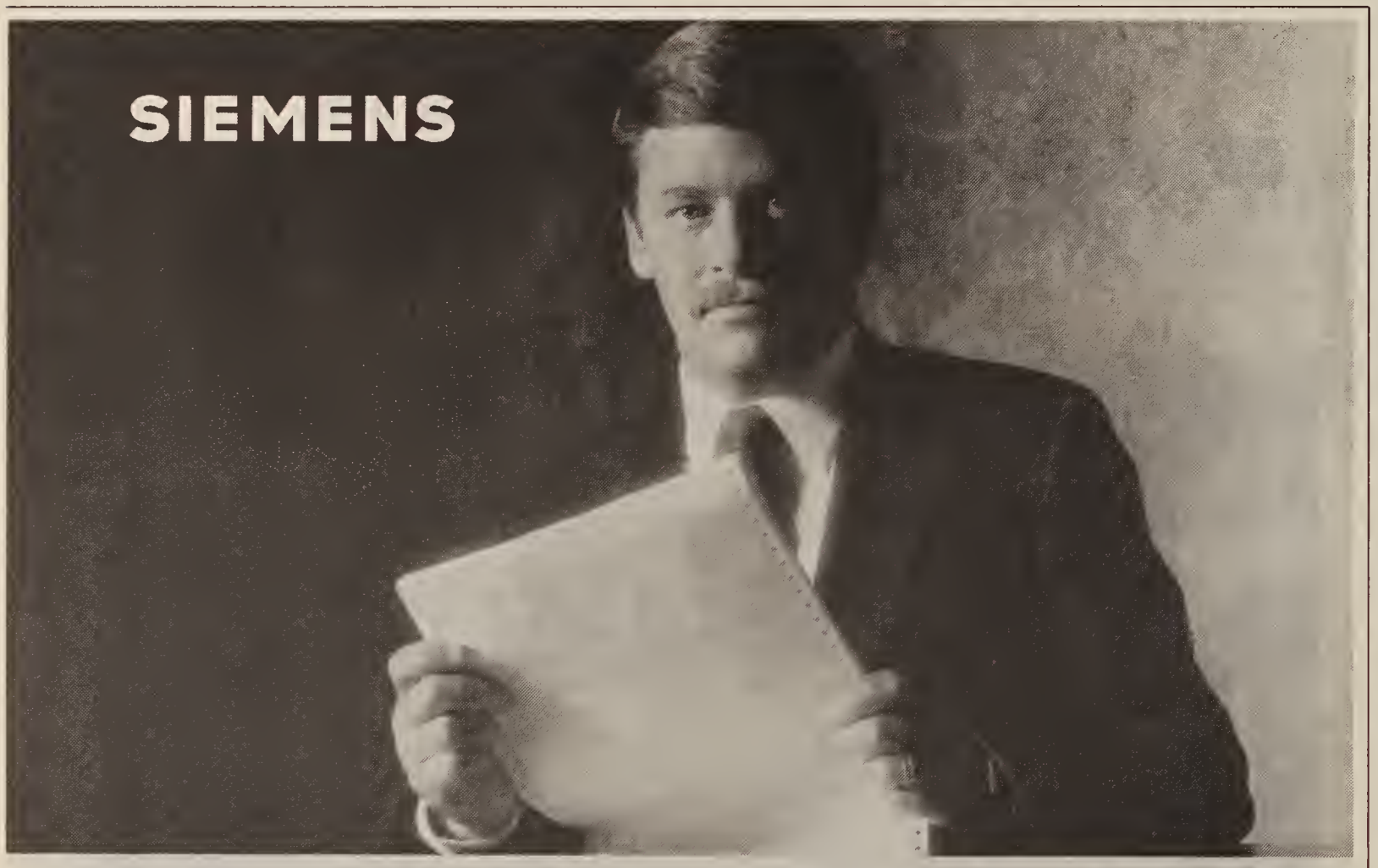
If the programmer had written "The project will be late and experience cost overruns because John has missed three meetings," the manager will probably try to light a fire under John and John's boss. Asking, "So what?" and doing nothing means the manager is shouldering responsibility for cost overruns.

Other key phrases are, "We lost X hours of time this week due to . . ." and "We worked Y hours of overtime on Project Z and will work XX hours of overtime during the next three months because . . ."

The comments in each report should be listed, not written as paragraphs. If the "So what?" technique is successful, each comment should be no longer than two sentences. And each unique comment should begin with a hyphen, asterisk or other delimiter. Thus, each activity and problem visually stands out as a separate entity that requires unique action.

The completed report provides an accurate account of the past and a look at the future. Although we may not eliminate the weekly status report, these methods will add structure to the method and provide more meaningful and concise information.

Reed is director of business systems at the Dallas County Community College District.



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INDUSTRY INSIGHT

Clinton Wilder

All we ask is straight talk

Like romantic protagonists in some James Michener epic, the software and services industry and the Wall Street investor community have had a long up-and-down relationship. While the folks at places like Microsoft and Oracle keep a special place in their hearts for the public markets that made them millionaires, many others have not appreciated the stock price roller-coaster ride.

Among the latter group, the oft-voiced complaint has been, "Those guys don't understand our business!"

Well, according to some leading software analysts and investors, the vendors have to shoulder at least part of the blame for that. Earlier this year, a Financial Analysts Federation (FAF) subcommittee chaired by Bahar Gidwani of Kidder, Peabody decided to study just how well software and services companies communicated with their investors. The results were decidedly mixed.

While some companies were singled out for superior investor relations, the committee found significant fault with many others. "Software companies

Continued on page 121

Andersen now a house divided

Consulting branch made autonomous; recent exodus one reason

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Arthur Andersen & Co., acknowledging the internal friction between its accounting and information systems consulting businesses, officially separated the two sides of its $2.8 billion house last week.

"This puts consulting on a more equal footing than it has been in the past," said Duane R. Kullberg, Andersen's chief executive officer. "It gives them an opportunity to operate as a strategic business unit."

Before the split, Andersen consulting partners had to report to regional managing partners, who were often accounting or tax specialists. This sometimes led to a dispute over how Andersen's capital budgets should be spent.

Andersen's consulting clients should see very little, if any, change, according to Kullberg. "Our software teams will still be sharing resources around the world," he said. "If anything, that sharing of resources would be enhanced."

Defections a factor

Kullberg admitted that recent defections by top consulting partners spurred the self-examination and reorganization. In October, several departed Andersen executives formed a rival consulting firm, the New York-based Information Consulting Group.

Andersen then sued the firm, which was partially financed with money from British advertising and consulting giant Saatchi & Saatchi Ltd. The Andersen lawsuit, still pending, contends that Information Consulting head Gresham Brebach and other former Andersen consultants conspired in attempts to sell the Andersen consulting practice to Saatchi & Saatchi.

"There were threats in the market," Kullberg said. "There have been the threats of people being stolen, and they were stolen. That caused us to step up these changes, because they were the kind of changes we were thinking would be responsive to partners' concerns."

Fees from information systems consulting accounted for $1.12 billion, or 40% of Ander-

Continued on page 121

Japan scoffs at U.S. chip accusations

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — The Electronic Industries Association of Japan (EIAJ) has charged the U.S. Semiconductor Industry Association (SIA) with ignoring what it called substantial and demonstrated progress in Japanese market access for U.S. chip vendors.

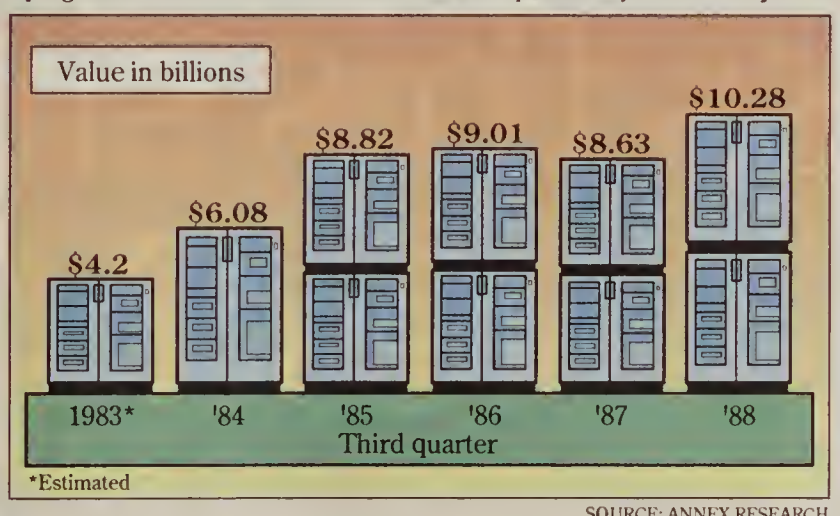
"Foreign semiconductor sales to Japan have increased by 87.5% in the past two years at a pace far surpassing the rate of growth in the overall Japanese market," said Iwao Ojima, presi-

Continued on page 123

Data View

IBM's record stockpile

Total value of IBM's inventory — including finished goods, work-in-progress and raw materials — in the third quarters of the last six years



SOURCE: ANNEX RESEARCH
CW CHART

High-tech is cleaning up

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — Trying to calm regional fears of widespread groundwater pollution from high-tech companies, the Clean Water Task Force of the Santa Clara Manufacturing Group released a study last week praising the industry for its "comprehensive effort" to clean up contamination.

The study, the second one conducted by the task force, covered most of the largest polluters in Silicon Valley, comprising a total of 99 sites. It noted that 83% of underground tanks holding hazardous solvents have been removed since 1982 and that 254 wells have been drilled to pump out contaminated water. The technology-related industry has spent more than $175 million in the last five years on pollution prevention and cleanup.

Of the sites surveyed for the study, computer manufacturers had the largest cleanup

Continued on page 123

Rolm, Apple vets forge 'smart' networks

BY JULIE PITTA
CW STAFF

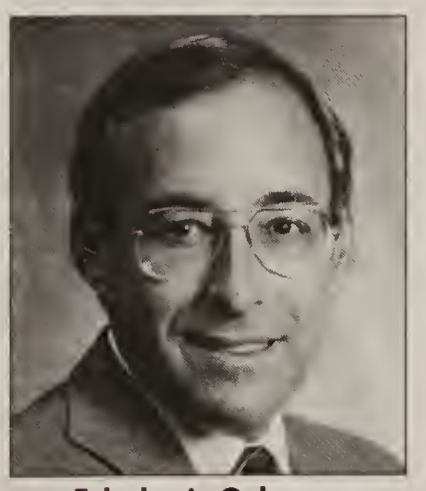
LOS GATOS, Calif. — Two prominent industry veterans have resurfaced with a new company chartered to develop systems that regulate devices ranging from televisions to factory-floor automation equipment.

Called Echelon, the firm was incorporated in February by Apple Computer, Inc. co-founder A. C. "Mike" Markkula to develop and market local operating networks (LON). Last week, Markkula, who is Echelon's chairman, appointed Rolm Corp. co-founder M. Kenneth Oshman as president and chief executive officer.

Oshman served as Rolm's president and CEO until that firm was acquired by IBM; he left IBM in 1986. Since then, he has served on the boards of numerous Silicon Valley computer companies.

Markkula is the Apple co-founder who provided Steve Jobs and Steve Wozniak with their first funding. He came up with the idea for Echelon in early 1986, shortly after forming an engineering team to study the concept. By October, Markkula decided enough progress had been made on a network protocol and a silicon chip to warrant forming a company.

Apple and Arthur Rock, an Apple board member, have invested in the new venture. Other investors include Venrock Associates and Henry Singleton, a founder of Teledyne, Inc.



Echelon's Oshman

Echelon officials declined to state the amount of financing the company has received.

A LON is a network that links different appliances or equipment, allowing them to communicate their condition to each other. "LANs transport data files between personal computers," said Anthony Livingston, Echelon's marketing director and a one-time founder of Gigabit Logic, Inc., a Newbury Park, Calif., maker of gallium-arsenide integrated circuits. "LONs transmit short control messages between operating devices.

"We've heard of smart buildings, smart cars and smart houses," Livingston continued. "LONs make them possible."

LON arm of the law

LONs are expected to regulate security systems, lighting, instrumentation devices such as patient-monitoring equipment and factory-floor automation equipment, he maintained. For instance, sensors could be attached to objects such as doors or windows in a building.

The condition of those objects — whether they are open or closed — would be communicated to a central device connecting systems such as lighting, heating or security. The LON would then regulate those systems according to the information it received from the sensors.

Products based on the new technology are expected to be introduced in a year. Echelon will sell LONs to OEMs, which will incorporate them into their own products. "We expect that LONs will be incorporated into things like television sets or security systems by the people who make them," Livingston said. He predicted that LONs will sell for as little as $10 per node by the early 1990s.

IN BRIEF

The winner is . . .

The results of the current battle for control of Zenith Electronics Corp. will be announced this week.

Zenith shareholders had until yesterday to vote on the proposal of New York investment group Brookhurst Partners to unseat seven current Zenith board members and add three of its own. Brookhurst is attempting to wrest control of the Glenview, Ill.-based electronics giant, reportedly to sell the loss-plagued consumer electronics business and to concentrate on the profitable Zenith Data Systems Corp. desktop and laptop computer operation.

. . . . . .

A stakeout

Netherlands-based Volmac Holding said it has taken through market purchases an 8.7% stake in Buffalo, N.Y.-based professional services firm Computer Task Group, Inc. Financial details were reportedly not disclosed.

The stake was a token of trust in the U.S. company and could lead to cooperation, according to Volmac. Volmac Chairman Joop van Oosterom said in August that he planned to take small stakes in U.S. software firms as an entry into those firms.

. . . . . .

We're out of here

Honeywell, Inc., which earlier expressed intent to restructure its Solid State Electronics Division to better fit the company's strategic direction, last week further defined that direction: It is getting out of the semiconductor business.

With a diminished internal need for circuits since its bolt from the computer business in 1986, President James J. Renier said, the Minneapolis-based firm is putting its 1,100-person Colorado Springs chip fabrication facility on the block.

Expect a sizable fourth-quarter charge in connection with the disposition of the semiconductor operation, Honeywell said.

. . . . . .

Born to buy

When talk in the currently merger-manic market turns to potential buyers for a given computer company, Unisys Corp. more often than not comes in for a mention.

At least some of the speculation could turn out to have been right: Earlier this month, the Blue Bell, Pa.-based giant reportedly filed a shelf registration with the Securities and Exchange Commission for some $400 million in debt securities. Funds raised by any offerings of these securities, according to Unisys, will be used to reduce outstanding commercial paper and also "for general corporate purposes, including acquisitions."

NICKELS & DIMES

Index Technology Corp. reported revenue for the third quarter ended Sept. 30 of $7 million, compared with $5.9 million in the previous year. Profits were posted at $526,000, or 11 cents per share, compared with $791,000, or 24 cents per share, in the comparable period one year ago.

Network Systems Corp. announced revenue for the third quarter ended Sept. 30 of $95.2 million, compared with $84.6 million last year. Profits were $9.9 million, or 34 cents per share, compared with $11.9 million, or 41 cents per share, in the previous year.

Capital Associates, Inc. reported revenue for the first quarter ended Aug. 31 of $27.7 million, up 62% from $17.1 million reported for the comparable period one year ago. Profits were $820,000, or 9 cents per share, compared with $1.4 million, or 15 cents per share, last year.

Emulex Corp. announced revenue for the first quarter ended Oct. 2 of $36.2 million, compared with $28.8 million last year. Profits were $3.5 million, or 30 cents per share, compared with $1.6 million, or 13 cents per share, a year ago.

Fiserv, Inc. announced revenue for the third quarter ended Sept. 30 of $36.2 million, compared with $21 million in the previous year. Profits were $2.4 million, or 29 cents per share, compared with $1.8 million, or 22 cents per share, in the like period a year ago.

Synoptics Communications, Inc. reported revenue for the third quarter ended Sept. 30 of $13.2 million, compared with $1.8 million last year. Profits were $2 million, or 30 cents per share, compared with $57,000, or 1 cent per share, in the comparable period last year.

Dataproducts Corp. reported revenue of $88.2 million and net income of $1.4 million, or 6 cents per share, for the second quarter ended Sept. 24.

Can your async network pass this simple test?

Wilder

CONTINUED FROM PAGE 119

seem poorly understood," the report said. "As a result, their stocks may react inappropriately to news items, making them more volatile than they should be. . . . Better investor relations and communications could help solve this problem."

Computer Sciences was rated the industry's best company in communicating with its investors, followed by American Management Systems (AMS) and Systematics. Honorable mentions went to Ashton-Tate, Automatic Data Processing and Software Publishing. You'll find most or all of those companies on several analysts' recommended stock lists, and that's not a coincidence.

It would be interesting to learn whether companies with high marks for investor relations also rate high in relations with another important group — their customers. I suspect there would be a high correlation.

Many of the criteria cited by the analysts apply to customers as well as investors. In the firms that fared poorly on investor relations, what the committee found lacking were details such as product line revenue breakdown, timely guidance, cost structure data and my favorite, "a willingness to acknowledge and openly discuss future risks and past mistakes."

Users, investors and journalists may not have too much in common, but one thing we all share is the desire for simple, straight talk from a company when all is not warm and fuzzy. We're not talking Bhopal or Tylenol-tampering here — just the inevitable rocks and bumps that a company will hit in an industry as fragmented and unpredictable as software and services.

The committee praised Computer Sciences for sometimes warning investors by phone of bad news to come and for openly discussing details of contracts it loses as well as those it wins. AMS was cited for understandable explanations of earnings shortfalls in specific areas.

Every company has its own corporate style, and customers, investors and reporters wouldn't want it any other way. It's much better that an IBM has an Apple, a Cullinet or an Amdahl playing alongside; nobody yearns for the days when General Motors, General Electric, General Foods, General Tire, General Cigar et al were the only game in town.

But we would like more consistency when it comes to openness, and companies that rate high on that count have proven that openness doesn't hurt profits or market share. Meanwhile, it helps build goodwill — and I don't mean the kind that the accountants compute on the balance sheet.

Wish list

The FAF committee concluded its report with a small wish list for next year, asking the would-be Santa Clauses of the software CEO community for more published revenue breakdowns, more complete information on cost structure and more realistic self-appraisals.

"The managements of software companies are becoming more professional as the companies mature," the analysts wrote. "We would hope to see managements more realistically appraise their strengths and weaknesses as part of taking a strategic view of their business."

Amen.

Wilder is *Computerworld*'s senior editor, computer industry.

Andersen

CONTINUED FROM PAGE 119

sen's total revenue, in the fiscal year ended Aug. 31. Kullberg said the firm intends to boost consulting revenue to more than 50% of the Andersen pie within five years. "We'd be very disappointed if it wasn't," he said.

Kullberg also announced that Andersen is considering several options to enhance its position as a leading systems integrator. "We are still perceived as a traditional accounting firm," he noted.

Media campaign

The company plans to launch a major media campaign next year to stress its 35-year role as an information systems consultant. Kullberg said the firm might explore the formation of a leasing subsidiary that would facilitate Andersen's packaging of turnkey systems for clients.

Last week's restructuring came just three months after a task force of 15 partners — six of them consultants — began to study reorganization plans and options. Andersen also combined its tax division with the accounting division, reducing the number of operating units from three to two.

The changes, which affect organization and partner compensation, are expected to be formally approved at the annual meeting of Andersen's 2,200 partners in January. "There are a lot of details to be ironed out," Kullberg said. "But the basic concepts we're outlining now are the same ones the partners will be voting on." If approved, the changes would go into effect September 1989.

Andersen plans to sweeten performance incentives for top consultants and to revise its worldwide compensation plan, which distributes all corporate dividends to its 2,200 partners. Both the accounting and consulting organizations will have chief operating officers reporting to Kullberg.

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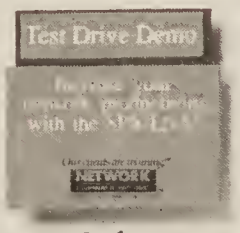

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ORDERS & CONTRACTS

Booke & Co., a leading actuarial and employee benefit consultant firm, has ordered a $3.3 million dual-processor A 17 mainframe from **Unisys Corp.** The system is installed in the company's headquarters in Winston-Salem, N.C.

Intergraph Corp. announced that it has been awarded a two-year contract to provide an automated nautical charting system for the **U.S. Department of Commerce's National Oceanographic and Atmosphere Administration** (NOAA).

The multiyear contract, which is known as Automated Nautical Charting System II, will modernize NOAA's existing automated system for nautical chart information, which has been in use since the mid-1970s. The contract could extend 10 years with a potential value of more than $10 million.

MSA Advanced Manufacturing, Inc. announced that two firms — **Maybelline**, a division of Schering-Plough Corp., and **Collins Defense Communications**, a unit of Rockwell International Corp., have signed contracts to license MSA's new Factory Control and Management System.

Network Management, Inc. announced that the U.S. Environmental Protection Agency has awarded the company's subsidiary, **CRC Systems, Inc.**, a $10 million contract for management of the agency's telecommunications networks. It is the largest such contract ever awarded by a civilian agency.

Ericsson, Inc. and the **University of Massachusetts** have signed a $29.5 million contract for the installation of a telecommunications network linking the university's three campuses. The contract is believed to be the largest ever awarded by a university for a digital private branch exchange system. The MD110 Intelligent Network to be installed by Ericsson will support over 30,000 lines at the university's campuses in Amherst, Boston and Worcester.

Language Processors, Inc. announced that five of its compiler products — Basic, Cobol, Fortran, Pascal and Code Watch, an interactive source-level debugger — are included in the U.S. Air Force contract awarded to **AT&T** Oct. 28.

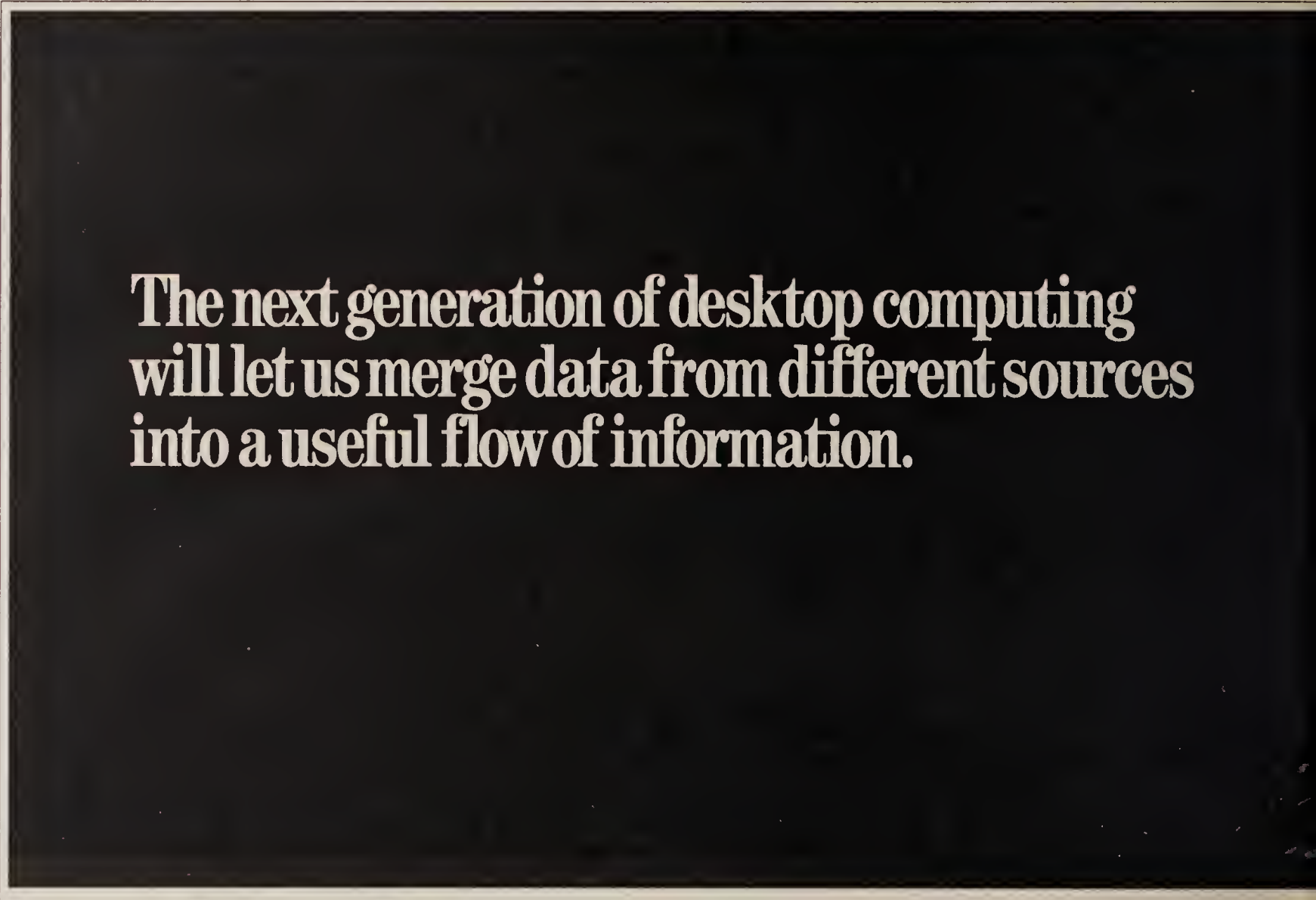
Cullinet Software, Inc. announced that it has signed a major contract with **AT&T** to provide the communications and computing giant with application-development and networking software from the Cullinet Enterprise Computing family. The products will enable AT&T's software developers to create applications that run on multiple computing platforms such as Unix, DOS and IBM's MVS without requiring the developers to learn more than one environment.

Intersystems Corp. announced a major contract with the **Psychiatric Institutes of America** (PIA) in Washington, D.C. The PIA, an operating division of National Medical Enterprises' Specialty Hospital Group, operates a system of psychiatric and drug treatment facilities as well as a toll-free cocaine hot line.

The company plans to install Intersystems' M/SQL, a relational database manager and application generator, in each of its sites in the U.S.

U.S. Sprint Communications Co. announced that the **Federal Aviation Administration** has formally accepted a private data network that Telenet Communications Corp., Sprint's data communications subsidiary, has designed, installed and will manage under a multiple-year contract.

The contract is for two years, with three one-year options. If all options are exercised, the total value will be about $18.7 million. Called the Administrative Data Transmission Network, it provides for roughly 8,000 terminal users to directly access multiple hosts via the network.



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Japan

FROM PAGE 119

dent of EIAJ, at a Tokyo press conference. Ojima pointed to statistics showing that more than 75% of U.S. advances in the Japanese market are being made by only five companies: Advanced Micro Devices, Inc., Intel Corp., Motorola, Inc., National Semiconductor Corp. and Texas Instruments, Inc.

But U.S. chip companies have complained that while their sales are expanding, so is the Japanese market — at an equal or higher rate. They say their market share has remained at a fairly consistent 10% for the past decade. EIAJ statistics show that the Japanese market expanded 55% from the third quarter of 1986 to $4.5 billion in the second quarter of 1988.

The EIAJ reaction came in response to a recent SIA report that showed some startling predictions. The SIA forecast that if Japan continues its noncompliance with market provisions of the 1986 semiconductor accord through its 1991 expiration, U.S. companies could incur sales losses of $1.4 billion to $2.2 billion. The losses, the report said, could result in 8,000 to 12,500 fewer jobs at U.S. chip companies.

Temperature's up

The semiconductor trade issue continues to be a highly emotional one. Last month, Japanese trade negotiators tried to get the remaining $165 million in sanctions removed from chip tariffs applied earlier, but their efforts failed. As evidenced by the recent SIA report and fast EIAJ answer, the two sides remain far apart in their perceptions of fair market play.

Aside from the rather energetic finger-pointing by both sides as to who is at fault for the chip trade snafu, statistics compiled in Japan show the U.S. lead in semiconductor technology slipping dramatically. According to a Nomura Securities analyst report in March, in the Japanese market, U.S. memory pioneers virtually disappeared by 1985.

By 1985, Japanese companies dominated 93% of their local memory market, with no U.S. firms showing even a trivial share. By 1988, following the 1985 chip recession, seven Japanese companies and only two U.S. firms were left to compete in Japan.

High-tech

FROM PAGE 119

problems but only accounted for 10% of the number of sites.

"Public drinking water is protected," said Jackie Bogard, the task force director. She said that despite widespread well contamination in the region, it is not industrial contamination.

Earlier this year, pregnant women in the area were advised not to drink tap water due to contamination problems.

"About half the people in the valley believe their water is contaminated," said Ted Smith, director of the environmentalist Silicon Valley Toxics Coalition. Smith said he believes industry progress is much less than the study indicates.

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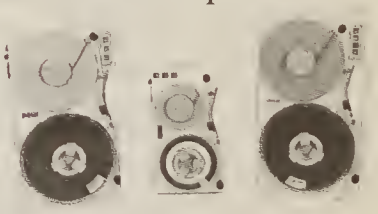

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DEC-IBM integration mixed bag

Marrying technologies means late nights but also visibility, premium pay

BY JANET MASON
SPECIAL TO CW

The title "communication specialist," often conferred on professionals working in an integrated IBM and Digital Equipment Corp. environment, is a bit of a misnomer. This kind of specialist, in fact, is confronted daily with a job requiring a generalist's wealth of expertise.

The makeup of a communication specialist is diametrically opposed to the traditional MIS professional's focus on one vendor's technology. Formal training is virtually nonexistent. Acquiring the skills in both DEC and IBM systems along with data communications is often a process of "baptism by fire," in the words of computer consultant Frank Dzubeck.

But for people who brave this initiation and sustain the long hours and ever-present problems, the rewards are many. A successful DEC-IBM integration is usually highly visible in the MIS department and company.

Salaries commensurate

This high level of visibility is frequently accompanied by higher salaries and better opportunities for promotion. Salaries for communication specialists generally range from $35,000 to $60,000, depending on experience level, type of company and geographic location, says Dzubeck, president of Washington, D.C.-based Communications Network Architects, Inc.

The boom times of DEC-IBM integration are over, but qualified people are still in demand. "There isn't the explosive growth that there was four or five years ago," says Patrick Farrell, senior principal at American Management Systems, Inc. in Arlington, Va. But more moderate growth should continue into the 1990s, until open systems architectures require a new set of skills.

Communication specialists can find opportunities in consulting firms as well as in corporate MIS. Integrated computing environments predominate in manufacturing concerns in which a DEC machine in the factory or research department needs to communicate with a corporate IBM mainframe.

Dzubeck points out that this need is particularly common in the pharmaceutical, petroleum and chemical industries. "The financial and insurance industries have distributed VAX and IBM environments," he adds, "but this usually entails VAX-to-IBM mainframe networking, which doesn't require as much staff involvement."

Consulting firms also offer opportunities. Farrell says they are a good place to learn different technologies and might pay better and offer more secure employment than MIS departments, albeit under higher pressure.

The ideal progression is to move from systems programmer/analyst positions with different mainframe environments to data and telecommunications and then to communication specialist, says Irv Shapiro, president of Irv Shapiro and Associates Ltd., a Skokie, Ill.-based systems integration firm.

> "THERE IS more opportunity in this position because of exposure to both IBM and DEC user communities. A well-done job is seen by lots of people in the company."
>
> JAY WERTMAN
> DU PONT

Tough training

However, an education in DEC-IBM integration is often hard to come by. Jay Wertman, senior systems specialist at Du Pont Co. in Charlotte, N.C., says, "It's often difficult to get a systems development background in DEC and IBM because it is expensive for companies to train people."

He nevertheless advises communications specialist hopefuls to seize any opportunity to learn another mainframe environment within their company or change jobs to do so.

Wertman, who heads a team of MIS people offering Du Pont's user community DEC and IBM interconnect gateways, began his career with the company 19 years ago as an industrial engineer. After working several years in engineering and then manufacturing, he transferred his Fortran programming skills to the company's data processing department. Starting as a programmer, he learned DEC systems and took several IBM Systems Network Architecture seminars.

Eventually, Wertman led a team that installed an electronic mail system based on a networked DEC All-In-One system and IBM's Professional Office System. The team began in the past year to offer DEC-IBM interconnect services to the rest of Du Pont.

In addition to adding more challenging work to his repertoire, Wertman says he has increased his promotional value. "There is more opportunity in this position because of exposure to both IBM and DEC user communities." he says. "A well-done job is seen by lots of people in the company."

Company person

Another advantage of the communication specialist position is that one can get involved in many aspects of the company, according to Shapiro. "Integrated IBM and DEC applications are leading the industry," he says, "and companies are betting their future success on them."

The position, however, also presents drawbacks. With primarily a DEC background, Wertman found working in an IBM environment frustrating. The IBM system is more loosely structured, with a variety of system managers rather than a central system manager in charge of installing and configuring software as with the DEC system.

Shapiro says the drawbacks include a lot of late nights and constant problems with the complex software and hardware configurations. "People in this position need to have strong problem-solving abilities and lots of patience," he says. "It's not a job for someone who just wants to maintain the status quo."

Mason is a Philadelphia-based freelance journalist.

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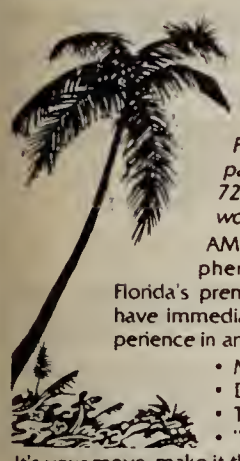

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Our MIS department is currently located in Gaithersburg but will be moving to Frederick by the end of the year. As one of the nation's top ten mortgage loan servicers, we can offer a highly competitive salary and excellent company benefits.

Interested applicants should send a resume and salary requirement to:

STANDARD FEDERAL SAVINGS BANK
P.O. BOX 9481
Dept. 0141
Gaithersburg, MD 20898-9481
Attn: G. Walter

We are an Equal Opportunity Employer

HI-TECH OPPORTUNITIES

Top DP placement agency has **100's** of MD, VA and U.S. wide openings for experienced DP professionals. Our clients include small, mid-sized and large commercial and defense firms. They offer excellent benefits and advancement. Some "hot" current openings include:

IBM SYS PROGRAMMERS	To $52K	OB2/SQL	$ OPEN
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ADABAS/NATURAL	To $48K	IMS DB/DC	To $52K
IDMS/ADS/O	To $50K	UNIX/C	To $45K
IBM TELCOM SPEC	$ OPEN	ORACLE	To $46K

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If you have:

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Looking for qualified computer professionals?

Look no further. More than 612,000 computer-involved professionals read Computerworld every week. And you can reach all of them-- or just the ones in your region -- with a regional or national recruitment ad in Computerworld's Computer Careers section.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

A Terrific Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

CULLINET MANUF.
CICS/ADR
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DOS/VSE S/P
TECH Writers P/C's
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IBM/SQL
SAS-Graph
IDMS/ADSO MANUF
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OS/MVS/DB2

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273

SYSTEMS PROGRAMMER

Financial Institution seeks experienced DOS/VSE S/P supporting CICS, VTAM, NCP, LAN, and voice response network. Excellent salary and benefits. Position is located in Rye, New York. Send resume to:

B. Simons
600 Midland Ave.
Rye, NY 10580

VAX Systems Manager

National Medical Information Company requires an experienced person to manage a large VAX cluster. Large data base management and telecommunications environment. Ample opportunity for growth. Send resume to: Director, MIS Personnel, Commonwealth Clinical Systems Inc., 1650 State Farm Blvd., Charlottesville, VA 22901.

Or: For further information call: Robert A. Reid M.D. or James Lee at (804) 977-1867

COMPUTER PROGRAMMERS
New York Area

Positions available for professional computer programmers with three or more years experience in a corporate environment working on mainframes, positions from 3 months to 12 months.

- Ingres & IBMS
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- SAS & SQL
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Please call: **(203) 375-9264**
or send resume to:
SACCO ASSOCIATES
P.O. Box 1136
Stratford, CT 06497-1136

When you compare costs and the people reached, Computerworld is the best medium for computer-related recruitment advertising.

Place your ads today!

Now... you can recruit the right people in the right places at the right price.

With the new IDG Communications Computer Careers Network, you can run the most targeted and cost-efficient recruitment program possible. You simply choose the combination of eight leading newspapers - **Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week,** and **Computer Currents**/ Northern California, Southern California, and Boston editions - that's right for you.

For all the facts on putting the Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Recruitment Advertising Sales Director, at 508-879-0700.

Sales Offices:

John Corrigan, Recruitment Advertising Sales Director, 508-879-0700

BOSTON: Al DeMille or Nancy Percival, 800-343-6474. (in Mass. 508-879-0700)

NEW YORK: Warren Kolber, 201-967-1350; Jay Novack, 800-343-6474.

WASHINGTON, D.C.: Katie Kress, 703-573-4115; Pauline Smith, 800-343-6474.

CHICAGO: Patricia Powers, 312-827-4433; Ellen Casey, 800-343-6474.

LOS ANGELES: Barbara Murphy, 714-250-0164; Chris Glenn, 800-343-6474.

SAN FRANCISCO: Barbara Murphy, 714-250-0164; Chris Glenn, 800-343-6474.

Data Processing Professionals

You Can Judge This Company By Its Covers

JOIN OUR SUCCESS STORY

Time Customer Service, Inc., is looking for Data Processing professionals who want to write their own page in our success story. Our state-of-the-art environment is the computerized nerve center which supports the magazine fulfillment for Time Inc.'s U.S. and international magazines such as *Time*, *People*, and *Sports Illustrated*.

In our IBM MVS/XA 3090 environment, we're setting the standards for the rest of the industry. We run on one of the nation's largest and most sophisticated on-line database operations utilizing CICS, COBOL and BAL. And, we provide a full range of programmer productivity support tools necessary to maintain our competitive advantage in technology. **We currently have the following Data Processing opportunities available at our Tampa, Florida location:**

Programmer Analysts
A minimum of 3 years' programming experience in BAL/COBOL, OS/MVS/XA, TSO/ISPF is required. Strong analysis and design skills are necessary.

Systems Analysts
A minimum of 5 years' experience with BAL/COBOL, as well as prior analysis and design skills are required. CICS is preferred.

Senior Systems Analysts
A minimum of 10 years' experience is required, including proficiency in CICS, BAL and COBOL with strong IBM exposure. Excellent organizational skills are essential.

Along with competitive salaries, excellent benefits and relocation assistance, we offer the added bonus of no state income tax. **For immediate, confidential consideration, please send your resume, with salary history, to: Time Customer Service, Inc., Personnel Manager, Dept. CW/1205, 1 North Dale Mabry, Tampa, FL 33609.**

Opportunities also exist at Southern Progress Corporation, publisher of *Southern Living* and *Cooking Light*, in Birmingham, Alabama for the following positions:

Assembler Programmers & Systems Analysts
A minimum of 3-5 years' assembler experience in a large IBM mainframe environment is required, along with a working knowledge of CICS and excellent technical problem solving skills.

If you are looking for a challenging opportunity with a progressive company, please forward your resume, including salary history, to: Jo Powell, Southern Progress Corporation, Dept. SP, 500 Office Park Dr., Birmingham, AL 35223.

We are an equal opportunity employer.

Time Customer Service, Inc.

TIME IS RIGHT IN TAMPA

MIS Opportunities

BMY is a division of the Fortune 300 Harsco Corporation. We are a recognized leader in the development and production of military tracked vehicles for the U.S. Government and our international allies.

We are augmenting our staff as part of a data processing modernization to dual IBM 4381 systems, running IBM's MVS/XA, and Cullinet systems and applications software (IDMS/R).

Professionals desiring to join our highly-regarded MIS team should forward resumes with salary requirements to:
John Cacciola, Manager
Employment
Administration
BMY/CSO-121
P.O. Box 1512
York, PA 17405

Manufacturing Systems Analyst
Assist in implementation of Cullinet manufacturing system and related financial modules. Modern, on-line environment. Requirements include an Associate Degree in MIS or related discipline and 3 years' experience in a manufacturing environment. MVS knowledge and Cullinet IDMS or ADS experience desirable.

IBM Systems Programmer
Responsible to install, test, maintain and support MVS/XA operating system. Knowledge of TSO, JES2, VTAM, RACF helpful. Requirements include an Associate Degree in Computer Science (BS preferred) and a minimum of 4 years' DP experience with at least 2 years as a Systems Programmer.

Data Base Administrator
Install, test and support Cullinet IDMS Data Base Software. Applications include manufacturing systems and financial modules. Requirements include an Associate Degree in Computer Science (BS preferred) and a minimum of 3 years' DP experience.

BMY
A Division of harsco CORPORATION

Principals Only, Please
Equal Opportunity Employer

SENIOR SYSTEMS ANALYSTS
DB2 PROJECTS

"I entered the consulting field to stay technically current. After seven years with Spectrum, that's precisely what I am."

Bob Giordano

One of the benefits of a career at Spectrum Technology Group are the professionals you work with. The cross-exchange of ideas and energy is one reason we have attracted some of the industry's greatest talent.

Right now, we would like to attract even more.

We are a consulting company that specializes in the use of Database Technology to solve business problems. The environment is electric, the assignments are challenging and the opportunities are unlimited.

At present, we are looking for **Senior Systems Analysts.** Applicants should have at least two years of experience as an Analyst using Structured Systems Analysis methodologies. Logical Data Modeling, Automated CASE Tools and Relational DBMS experience would be a plus. We are also staffing several **DB2 Projects** and are looking for Programmers, Designers and DBA's with expertise in DB2.

Yes, we are looking for that exceptional person. But to that person we offer an exceptional opportunity. Our firm is young and growing. You'll grow with us. You'll participate in our management. And you'll grow professionally. You'll probably learn more than you have in previous jobs. And we'll benefit from your experiences.

We offer excellent salary and benefits. If you believe you are the truly exceptional professional we're looking for, we want to talk with you. Now.

Please call or write our offices today.

New Jersey
Judy Dirk, (201) 725-4000
1250 Route 28, P.O. Box 5365
North Branch, NJ 08876

SPECTRUM
Technology Group, Inc.

Philadelphia
Joe Gross, (609) 779-2626
1040 N. Kings Hwy., Suite 617
Cherry Hill, NJ 08034

Florida
Terry Wilkes, (407) 682-1300
1110 Douglas Ave., Suite 2040
Altamonte Springs, FL 32714

Washington, DC
Jill Camp, (301) 424-9196
51 Monroe Street, Suite 1210
Rockville, MD 20850

TARGET OPPORTUNITIES

Let us put our top notch staffing specialists to work for you. Hundreds of current needs include

UNIX Internals	to $65K
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IMS DBA's	to $70K
UNIX/C	to $50K
COBOL/CICS	to $45K
VTAM/NCP	to $65K
TANDEM (TAL, COBOL)	to $48K
CICS Internals	to $65K

TARGET SEARCH, INC.
7650 Standish Place
Suite 105
Rockville, MD 20855
VOICE: 301-340-7009
DATA: 301-424-0525

Mid-Atlantic Area
Nationwide Affiliates

Data Processing Programmer/Analyst

The Mobile Press Register, southern Alabama's leading newspaper with a circulation over 100,000 plus, needs an individual with 1 to 3 years Hewlett-Packard COBOL programming experience. Candidate must possess strong communication skills and be a self-motivator. Collier-Jackson Advertising and Circulation experience a strong plus. Competitive salary and excellent benefits offered. Send resume and salary history to:

PERSONNEL DEPARTMENT
The Mobile Press Register
P.O. Box 2488
Mobile, Alabama 36630

An Equal Opportunity Employer

PROFESSIONAL PROGRAMMERS

We have immediate openings available for talented, experienced programmers in a variety of Southeastern locations. These positions are full time and we will consider either salaried or contract arrangements.

Our current needs are: **ADABAS/NATURAL, IDMS ADS/O, ORACLE, DOE "Q" CLEARANCE, IBM SYSTEM/38, MANTIS/SUPRA, AS/400, IMS/DB2/DL1, CICS, TANDEM and VAX COBOL/FORTRAN.**

NO RESUME REQUIRED
FOR IMMEDIATE CONSIDERATION TELEPHONE
800-874-9595

NPS
CONTRACT PROGRAMMING
NATIONAL PROGRAMMING SERVICES, INC.

121 EXECUTIVE CENTER DRIVE ☐ SUITE 240 ☐ COLUMBIA, SC 29210
TELEPHONE 803-772-9412

Blue Cross Blue Shield of Georgia

SENIOR PROGRAMMERS

Georgia's largest health care insurer is expanding EDP operations. We have immediate openings for Senior and Lead Programmer Analysts.

Qualified applicants must have a minimum of 4 years IBM Mainframe experience in MVS environment with a minimum of 1 year hands on experience in one of the following: structured techniques (Analysis, Design, Programming, Walkthroughs and Development Methodologies), 4GLs (such as FOCUS), Function Point Analysis, and CASE tools and techniques. Additional experience in the following areas would be helpful: Software Testing Standards, TSO/ISPF, IBM PC Hardware and Software (dBase, Lotus, etc.) An associate or BS degree is preferred. Excellent oral and written communication skills are required.

Excellent benefits to include company paid health, life, vision, dental, tuition reimbursement, and Employee Assistance Program.

Qualified applicants should send a confidential resume to:

PERSONNEL ANALYST
P.O. BOX 7368
COLUMBUS, GA 31908-7368

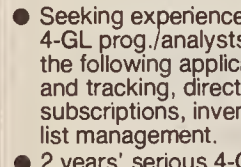
E.O.E. M/F/H/V

BUSINESS/SYSTEMS
Manager—User Support

INTERGRAPH CORPORATION, a Fortune 500 leading-edge designer and manufacturer of interactive computer graphics systems, has an immediate opportunity for a MANAGER—USER SUPPORT in our Huntsville, AL Corporate Information Services organization.

Requires a four year degree and 6 + years applications development and support experience and previous supervisory/management authority. Position will supervise a team of 8 supporting existing applications and quality assurance of new applications. Knowledge of COBOL is mandatory. Experience with Database, VAX/VMS, UNIX, and 'C' is desired.

INTERGRAPH offers attractive salaries, excellent benefits and growth opportunities. For confidential consideration, please send resume with salary history/requirements to: **Howard Speck, Dept. CW12/5, INTERGRAPH CORPORATION, One Madison Industrial Park, Huntsville, AL 35807-4201.** An Equal Opportunity Employer, M/F/H/V. Proof of eligibility to work in the U.S. is required. No Agencies, Please.



INTERGRAPH

SUPERCOMPUTER CONSULTANT

40 HRS. 8AM-5PM. Master of Science - Science or Engineering - 2 years experience and one month training classes on Supercomputers. Will assist the director of Supercomputer Computational Research institute define research objectives; assist researchers use the ETA10 effectively; develop new mathematical algorithms, new application programs, and new operating system software. Senior personnel assigned to Florida State University. Must have experience on CYBER 205 and ETA10 Supercomputers. $3,750 Month. Resume to Job Service of Florida, 1307 North Monroe Street, Tallahassee, Florida, 32303. Affirmative Action Employer, REF: JOB ORDER #FL0007708.

PROGRAMMERS/ANALYSTS

RESPONSE TECHNOLOGIES is one of New England's leading providers of database services for lead initiation, lead management, direct marketing, and on-line reservations. Located 50 minutes due south of Boston. (Bring your boat!)

- VAX/VMS/4-GL/POWERHOUSE environment
- Seeking experienced middle and senior level 4-GL prog./analysts to develop programs for the following applications: lead initiation and tracking, direct marketing, circulation and subscriptions, inventory control, telemarketing, list management.
- 2 years' serious 4-GL and VMS experience and superior communications skills required. Knowledge of Powerhouse, Pascal, networking and a BCS or better a real plus.
- Excellent salary and benefits commensurate with experience.
- Send your resume with salary history and cover letter to: Christopher Edwards, VP, Response Technologies, 376 Nash Road, New Bedford, MA 02746.

It's easy to place your recruitment ad in Computerworld!

All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 617-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 7 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 6 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4″	2″
2 columns	2-5/8″	2″
3 columns	4-1/16″	3″
4 columns	5-9/16″	4″
5 columns	6-15/16″	5″
6 columns	8-3/8″	6″
7 columns	9-3/4″	7″

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $12.60 per line or $176.40 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $8.00 per line or $112 per column inch. You can run your ad in any two regions for $10.60 per line or $148.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4″ wide by 2″ deep) and costs $352.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $88.20 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1-4/16 inches wide) by two inches deep (like this sample). This ad would cost $352.80 in our national edition, $224.00 in the Eastern, Midwestern, or Western Edition, and $296.80 in two regions; volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
1 column x 2″	$ 224.00	$ 296.80	$ 352.80
2 columns x 2″	$ 448.00	$ 593.60	$ 705.60
3 columns x 3″	$1,008.00	$1,335.60	$1,587.60
4 columns x 5″	$2,240.00	$2,968.00	$3,528.00
5 columns x 7″	$3,920.00	$5,194.00	$6,174.00

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Network World, InfoWorld, Digital News, Federal Computer Week*, and *Computer Currents*. Call for details.

Computerworld Recruitment Advertising Order Form

Ad Size:_____ columns wide by _____ inches deep

Issue Date(s): _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Region: ☐ East ☐ Midwest ☐ West **National:** ☐
☐ East/Midwest ☐ Midwest/West ☐ East/West

Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
800-343-6474 (In MA, 617-879-0700)
Telecopier Extensions: 739 or 740

We Can't Keep Our Telecommunications Opportunities Quiet!

The Automated Systems Office of the Library of Congress is responsible for the development, maintenance and implementation of the Library's automated programs. In addition the Office plans and researches the application of automated techniques to the Library's processes for centralized electronic operation.

Chief Telecommunications Officer (GS-391-15, $54,907-$71,377)

The Library of Congress, Automated Systems Office, is seeking an experienced executive to coordinate network policy. Candidates will develop technical standards for voice and data, monitor the installation/maintenance of telecommunication equipment, service wire plans and serve as technical monitor for telecommunication contracts.

Candidates should have knowledge of OSI, TCP/IP and SNA, 3 years demonstrated experience in modern telecommunication concepts for voice and data. Ability to plan/manage large scale projects and the ability to communicate both technical and administrative information effectively.

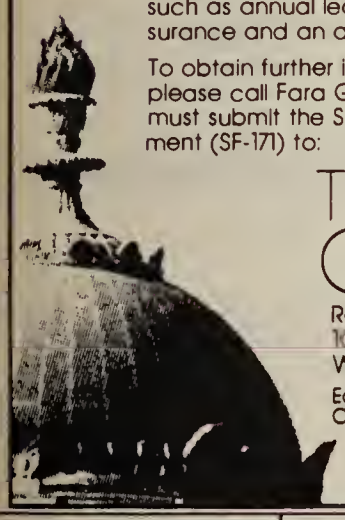
Communication Specialists (GS-393-7/9, $18,726-$29,793)

The Automated Systems Office needs Communication Specialists to troubleshoot and install communication equipment, communication lines, telephone and computer terminals, assist vendors in diagnosing and repairing problems. In addition you will perform detail tests on communication facilities and equipment, and problem solving.

Candidates must have a Bachelor's degree or 3 years general experience, 1-2 years telecommunication experience with large scale on-line teleprocessing system using IBM 3084 computers with Comten processors or similar equipment. Knowledge of telecommunication, computer hardware and telephone switching system a plus.

In exchange for your dedication and experience, we offer competitive compensation, including excellent benefits such as annual leave, sick leave, salary reviews, health insurance and an attractive retirement savings plan.

To obtain further information and application materials, please call Fara Guest at (202) 707-5620. All candidates must submit the Standard Application for Federal Employment (SF-171) to:



THE LIBRARY OF CONGRESS
Recruitment and Placement Office Dept. E.
101 Independence Avenue, S.E., LM-107
Washington, D.C. 20540

Equal Opportunity Employer
Civil Service Status Not Required

Data Processing Professionals

From all over the world, industrial corporations come to us for the finest in software development. In fact, over 85% of the companies on the Fortune 500 list rely on our products for their success. As the largest, most successful, independent worldwide developer and supplier of software, we are able to offer challenging opportunities to those who aspire to work with the leader in software innovation.

Senior VM Development & Support

Must have 5+ years experience with the VM operating system on the IBM MAINFRAME. BAL coding and testing a must.

- ☐ Problem determination and analysis.
- ☐ Installation and maintenance of operating system software and program products.
- ☐ System modification to CP or CMS (or other sub systems).
- ☐ Knowledge and experience in CP and CMS internals.

Divisional Systems Engineers

Positions available for individuals who will install our software and train clients in its use and implementation. These highly visable positions require a minimum of 2 years experience with systems software in an IBM MVS or VSE environment. Knowledge of systems security packages; CA-ACF2 and/or CA-TOPSECRET a definite plus. Some travel required.

BAL Development & Support

Positions available for individuals with 4+ years experience using ASSEMBLER language on the IBM MAINFRAME. Experience in the following would be a definite plus: COBOL, TSO/ISPF, CICS, Compiler, Debugging and Dump analysis.

COMPUTER ASSOCIATES INTERNATIONAL INC. offers an industry leading, company paid benefits package and unlimited growth opportunity. For immediate consideration, send resume indicating desired position to: **Personnel Department CW, COMPUTER ASSOCIATES INTERNATIONAL INC., 711 Stewart Avenue, Garden City, New York 11530.**

COMPUTER ASSOCIATES®
Software superior by design.

Equal Opportunity Employer m/f/v/h

CITY OF ORLANDO

EXCITING CAREER OPPORTUNITY IN INTERNAL AUDITING

The City Beautiful is actively recruiting for the position of EDP Audit Manager. The successful applicant will be responsible for performing and managing advanced professional auditing work related to data processing systems applications.

Position requires applicants with a Bachelor's degree in Accounting, Data Processing or related field and five (5) years of recent progressively responsible auditing/accounting experience, three (3) of which must have been auditing electronic data processing systems. CPA or CISA desired. Position opened until filled. Submit resume and salary history to:

CITY OF ORLANDO
Employment Office
440 S. Boone Avenue
Orlando, FL 32801

Equal Opportunity Employer
M/F/Handicapped/
Veteran Preference

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; IMS; ADABAS; ORACLE; DB 2; FOCUS; ADR DATACOM; SAS; VM/CMS; S/38 RPGIII or COBOL; DEC/VAX COBOL or FORTRAN; HP3000; Series 1; Financial; Mfg.; Banking; Insurance; MSA; Point of Sale; CPCS; MVS, VM, NCP/VTAM or CICS Systems Progrs; DEC/VAX Systems Mgrs; Database Analysts; Method 1 or similar methodology. Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite 7
Raleigh, NC 27609
(919) 782-3024

PROJECT ADMINISTRATOR

S.W.I.F.T., Society of Worldwide Interbank Financial Telecommunications, is seeking a Project Administrator.

The candidate selected will be responsible for:

- Developing and implementing standards and procedures for planning Organuizing, Scheduling and Estimating Projects, and monitoring the effectiveness of same.
- Assisting managerial and supervisory staff in the development of planning, scheduling, and estimating information.
- Investigate and select appropriate tools to perform these functions.
- Forecasting schedule performance
- Develop and implement standards and procedures for reporting, and monitoring the effectiveness of same.
- Data collection and preparation of various reports

The successful applicant will have a minimum of five year's project management experience in a system development environment, be experienced with project management tools, be detail-oriented, and have strong organizational and communication skills.

S.W.I.F.T. located in an attractive rural setting, offers an outstanding salary and benefits program inculding full relocation, medical, dental and life insurance programs, 401 (k) Plan, pension plan, sports and mortgage assistance. Candidates should send resume and salary history to:

Kathl Walker
Technical Recrulter
S.W.I.F.T.
Box 2005
Culpeper, VA 22701

SWIFT

The Society for Worldwide Interbank Financial Telecommunications

EOE M/F/V/H

DEC $34,000
Well established software firm seeks Programmer/Analyst. PDP, RSTS/E, BASIC+2. Co will relocate.

IBM $40,000
Large Louisiana based corp seeks team player. OS, COBOL, CICS req. DB exp a plus. Co will relocate.

PROJECT DEVELOPMENT MANAGER..... $55,000
This is an outstanding opportunity for someone with hosp or med industry exp. Systems analysis, design and implementation are req along with 3 yrs of management preferably in an OS/MVS environment.

DIRECTOR OF PROG $80,000
This position requires someone to have at least 10 yrs of exp in managing programmer and project groups. A strong bkgrd in PASCAL, MSDOS and microcomputers is a must. Prefer someone who has taken a product (software) from inception to market.

ROBERT HALF
DATA PROCESSING
1360 Post Oak Blvd.
#1470
Houston, Texas 77056
800/356-1994

OPPORTUNITIES

MIDWEST-EAST-SOUTHEAST

Mgr, DB Adm, IDMS	$55-65K
DB Admin, IDMS	$35-50K
DB Admin, IMS, DB2	$35-52K
Mgr, SysProg MVS, VM	$45-65K
Sr Cap'ty Plnr, MVS	$45-53K
Sys Prog's MVS	$37-55K
Sys Prog's VTAM	$35-45K
Prg, P/A, IDMS, ADS/O	$30-50K
P/A's, IMS, CICS	$30-42K

Robert Ekey, CPC
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The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 7 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 6 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4″	2″
2 columns	2-5/8″	2″
3 columns	4-1/16″	3″
4 columns	5-9/16″	4″
5 columns	6-15/16″	5″
6 columns	8-3/8″	6″
7 columns	9-3/4″	7″

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $12.60 per line or $176.40 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $8.00 per line or $112 per column inch. You can run your ad in any two regions for $10.60 per line or $148.40 per column inch. In all cases, you can earn volume discounts.

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Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1-4/16 inches wide) by two inches deep (like this sample). This ad would cost $352.80 in our national edition, $224.00 in the Eastern, Midwestern, or Western Edition, and $296.80 in two regions; volume discounts apply.

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	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
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3 columns x 3″	$1,008.00	$1,335.60	$1,587.60
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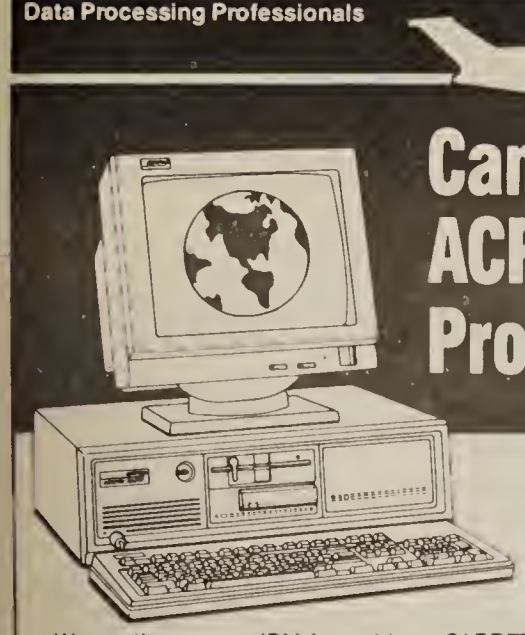

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The incumbent will provide consultation and training on data analysis and the data dictionary, as well as research, evaluate, and develop/administer software that supports data analysis activity. This position involves interfacing with end-users, data planners, system developers, consultants, and analysts. Four-year degree in Business, Math, Engineering or Physical Science and two years experience as a programmer/analyst, computer operations analyst or systems analyst is required. Knowledge of Data Manager dictionary products, techniques and software tools, CLIST, SAS, COBOL, and relational data base technology is a plus. **Send resume to Dept. DACW.**

Programmer Analysts

Responsibilities involve performing structured analysis of business requirements and designing computer systems and data base structures to support requirements. You will also prepare program specifications and documentation; write, test, and implement complex computer programs and systems; and provide training as required. BS in Business, Math, Engineering or Physical Science and two years programming and analysis experience is required. Knowledge must include COBOL, TELON, OS/JCL, TSO/SPF, CICS, IMS/DL1 and DB2, and principles of structured/essential systems development and programming. **Send resume to Dept. PACW.**

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XCOM 6.2 eliminates the need for extensive custom programming when transferring data from one computer to another, including PCs, mainframes and minis. And it significantly lessens the amount of time necessary to complete connectivity projects.

Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in *Computerworld*. So when Spectrum began implementing its marketing strategy for the new product, he considered *Computerworld* a key resource.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, Computerworld's *was the card deck we thought of first.*

— Alec Gindis
President
Spectrum Concepts, Inc.

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld *Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards.*

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. Computerworld *Response Card Decks give us the best cost per lead of any medium. They also let us refine our marketing strategies through scientific 'split testing' — something other card decks don't always offer. We consider that a valuable bonus."*

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COMPUTERWORLD
RESPONSE CARD DECKS

Computerworld is an IDG Communications Newspaper

System/36 users favor upgrades

Laggard AS/400 migration propels disk prices, tightens secondary supplies

BY TONY MEMBRINO
IDC FINANCIAL SERVICES CORP.

Perhaps IBM forgot to notify its System/36 users of its announcement of a new processor that will allow them future growth unheard of with their current systems. Judging by the activity in the System/36 secondary marketplace, it is as if IBM never introduced the Application System/400 at all.

According to IDC Financial Services Corp.'s third-party contacts, System/36 user migration to the AS/400 has been minimal at best. Apparently, the "you try it first" attitude is prevalent and has become some System/36 users' modus operandi. Some of the factors contributing to the current situation include the following:

- Price/performance of the AS/400 is not significant. Currently, it is more economically feasible for System/36 users to upgrade their existing processors via the secondary market.
- Users' existing System/36 systems are sufficient to satisfy current processing needs.
- AS/400 performance suffers while operating in the System/36 Execution environment. IBM has appeased its AS/400 B10 and B20 users by offering free 12-month loans of 4M-byte cards, which will reportedly solve their performance problems. However, dealers have noted that some users may have to advance to a higher model to satisfy performance requirements. This move means higher prices.
- Conversion to the AS/400 has been a difficult process for System/36 users.

Before IBM brought the AS/400 to market in June, an IBM 5360 B24 was retailing at $27,000. Since that time, however, used prices for the B24 have fluctuated. In September, a B24 was available used for $20,800. This decrease in price indicated the availability of used B machines at the time. In October, the value for a B24 rose to $22,534. The increases in the used prices of the 5360 line center on the 200M- and 358M-byte drive and B to D model upgrade.

> APPARENTLY, THE "you try it first" attitude is prevalent and has become some System/36 users' modus operandi.

Since a significant number of users have yet to migrate to the AS/400, secondary market activity has focused on demand for System/36 upgrades, which primarily entails the addition of a 200M- or 358M-byte drive. The increasing demand for these disks places a heavy burden on dealers to satisfy end users' requests for more capacity.

Once it became apparent that many System/36 users were reluctant to move to the AS/400, dealers began looking to acquire System/36 machines in order to strip them of their disk drives, and in the case of 5360 D processors, the model B to D upgrade. As a result of this activity, the supply of these systems, and consequently the upgrades, have tightened to the point where a D processor is virtually nonexistent on the secondary market.

Drive demand up

The wholesale price for a used 200M- and 358M-byte drive last month was approximately $10,500 and $18,500, or 69% and 98% of list, respectively. At this time, there is virtually no supply of used 358M-byte drives, but there is more demand by end users for greater capacity achievable with these drives, thereby creating the higher price. The demand for the 5360 B to D upgrade is also strong and is trading at $8,500 dealer to dealer.

Recent research reveals that dealers are expecting the current demand for System/36 upgrades to continue for the rest of the year. Any supply of System/36 processors that results from end-user migration to the AS/400 will be quickly absorbed.

It should be noted that there is little interest in end users adding additional systems. The increased values in the disk drives make up a disproportionate amount of the overall price of the system. Therefore, as System/36 upgrading diminishes, and migration to the AS/400 continues, it can be expected that values for the System/36 will decline sharply.

For more information, contact IDC Financial Services' Terri LeBlanc at 508-872-8200.

The BoCoEx index on used computers

Closing prices report for the week ending Nov. 25, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$600	$900	$400
XT Model 086	$1,150	$1,250	$900
XT Model 089	$1,300	$1,575	$1,050
AT Model 099	$2,050	$2,400	$1,700
AT Model 239	$2,375	$2,900	$1,800
AT Model 339	$2,450	$3,600	$2,425
PS/2 Model 30	$1,650	$1,700	$1,300
PS/2 Model 50	$2,400	$2,600	$1,900
Compaq Portable I	$700	$975	$650
Portable II	$1,700	$2,000	$1,650
Portable III	$2,500	$3,550	$2,500
Portable 286	$1,775	$2,400	$1,675
Plus	$1,100	$1,250	$800
Deskpro 20-MHz	$1,150	$1,500	$800
Deskpro 286	$2,400	$3,150	$1,800
Deskpro 386	$4,325	$5,100	$4,100
Apple Macintosh 512	$750	$950	$550
512E	$875	$1,025	$600
Plus	$1,125	$1,325	$950
Plus 20-MHz	$1,425	$1,650	$1,275
SE	$2,000	$1,950	$1,700
SE 20-MHz	$2,550	$2,675	$1,800
II	$3,300	$3,500	$3,275
Apple Laserwriter II-NT	$2,700	$3,000	$2,550
NEC Multispeed	$850	$900	$825

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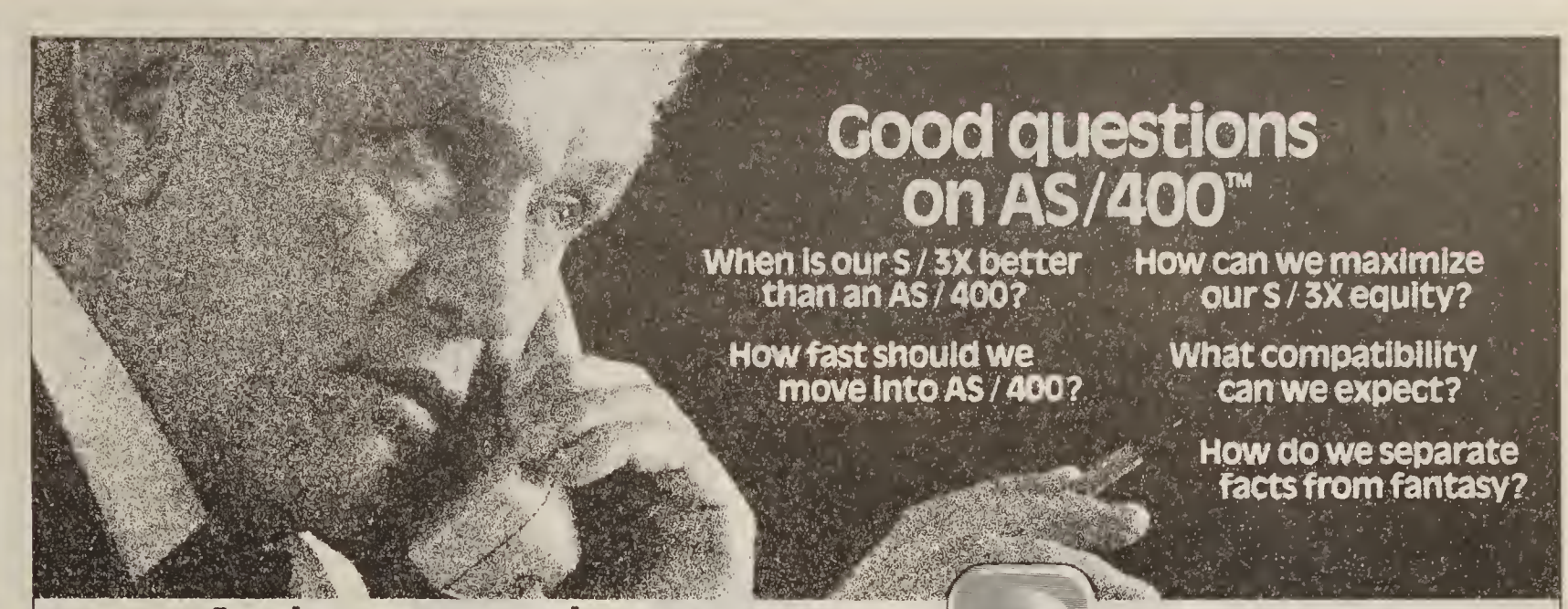

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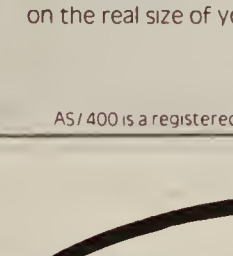

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The New York City Transit Authority ("the Authority") is seeking responses to identify experienced vendors interested in providing technical information for the availability of a microfilm/laser imaging system that has the capacity to retrieve and display at on site as well as off site locations.

The "pictures" of documents are stored in the Authority's image library, which consists of an estimated total of 3.5 million images. This image library is currently growing at the rate of 150,000 images per year. The Authority's goal is to automate, integrate and consolidate a microfilm/laser imaging system, utilizing both photography, microfilm, and laser technology. The material photographed must be established in a file which is retrievable in a matter of seconds and has the ability to print hard copies immediately upon request. This system must have the ability to interface with a current IMNET microfilm imaging system.

Interested firms are requested to submit a letter of interest, including detailed information about their experience and qualifications. Said letter along with attachments must be received at the address indicated below not later than December 19, 1988.

Responses are to be submitted to:
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Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1454, due Monday, December 19, 1988 at 3:30 p.m. for the acquisition of a small distributed processor to network with an IBM 4361 for the Office of Academic Affairs at ALCORN STATE UNIVERSITY. No charge.

Request for Proposal No. 1456, due Wednesday, December 28, 1988 at 3:30 p.m. for the acquisition of 16 80386-based microcomputers, 16 Digitizers, 1 Plotter, 10 AUTOCAD Version 10 and related peripherals for the Drafting and Design Technology Program at HINDS COMMUNITY COLLEGE. No charge.

Request for Proposal No. 1457, due Tuesday, December 20, 1988 at 3:30 p.m. for the acquisition of 25 microcomputer systems and peripherals for MISSISSIPPI GULF COAST COMMUNITY COLLEGE. No charge.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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TRAINING

A way to charge back training

Try sharing overhead costs and collecting fees for individual courses

BY BILL SEBRELL
SPECIAL TO CW

Whether to charge back the cost of training is as argumentative an issue as whether organizations should be centralized or decentralized.

Even after opting to charge back, however, an organization still must resolve how to charge a fair rate without either crippling the training department or shortchanging clients.

When technical training was bundled with hardware, charging back to internal clients was a fairly simple task. In most cases, the training was delivered free by the hardware vendor.

So, except for a course or two on generic business issues delivered by vendors, the only costs involved were travel and living expenses. Figuring the amount to charge back to an internal division was simple and straightforward. It was easily budgeted, simple to administer and rarely arguable by the client.

Things are considerably different today. In nearly every organization, there are the costs of instructors, administration, classrooms, a smorgasbord of hardware and software, machine connect time, technical manuals, handouts, printing, maintenance and upgrades, not to mention training the trainers.

Many of these items are unique to the training department and fall under an annual lease or contract, some running several years. Some items are expensed in the year that they are purchased; others are capitalized and depreciated over various lengths of time.

The questions

If you are charging back, how do you equitably assess services from year to year without a horrendous pricing and control system resulting? Who pays for the training department to experiment with new delivery technologies and test commercially available training courses? How do you charge for needs analysis, particularly when the client chooses not to go forward with the program?

Even the leases for videotape, interactive video and computer-based training (CBT) programs become confusing, with many based on a monthly rental, and the courses become extremely difficult to price.

Do you charge back on an hourly basis, a per-student basis or a course basis when you may have different numbers of students from different internal cost centers spending different amounts of time on a "course"? How do you set equitable charges for a micro CBT course that may only cost $50 but is used by hundreds of students during several years?

With students using self-paced study at night or on the weekend on their own time, how do you keep track of use without a tremendous amount of administrative overhead that far exceeds the cost of the course while still charging a reasonable rate?

In most organizations, the cost of technical training comes under the MIS department's budget and control. I feel full chargeback does nothing more than give the organization a false sense of control and severely hampers the training effort.

In the long run, the MIS organization suffers and the training costs get out of control. Many times, this situation develops because managers will hide the costs in other budget categories and look for ways of avoiding the internal charges, which must include the overhead items. This avoidance usually takes the form of going to outside courses, contracting with vendors or starting a duplicate training function.

> IN NEARLY every organization, there are the costs of instructors, administration, classrooms, a smorgasbord of hardware and software, machine connect time, technical manuals, handouts, printing, maintenance and upgrades, not to mention training the trainers.

The answer is . . .

There is an answer to the chargeback dilemma. A suggested tactic is to take all of the projected operational costs for the coming year and forecast the use — or, better yet, tally the actual use in past years. These allocated costs may be negotiated at budget-approval time but, once set, should be charged for the year no matter what changes occur.

On top of this base operating cost, any classes run by in-house instructors or vendors could now be charged back at a student-day rate based on the actual cost of delivering that particular course.

Self-study material would now be delivered free because the cost has already been developed in the base allocation. There would be no need for an elaborate cost-tracking system and the necessary supporting administration.

Clients would not have to fear unanticipated charges. The corporation could get on with its business without elaborate budget manipulations by clients who need and want timely training to do their job.

The corporation gets control of the costs, the training department can do its job professionally and, most importantly, the clients get the training and service that they need to move forward.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

1989 Computerworld Editorial Contents

12/26 - 1/2/89	- Forecast '89
1/9	- Executive Report: MIS in Education
1/16	- Product Spotlight: Corporate Electronic Publishing
1/23	- Executive Report: Restructuring MIS - The Data Center
1/30	- Product Spotlight: Micro-to-Host Links
*2/6	- Special Report: Communications Innovations
2/13	- Special Report: Recruitment Product Spotlight: Performance Management Tools
2/20	- Executive Report: Strategic Planning
*2/27	- Product Spotlight: Relational DBMS
*3/6	- Special Report: Systems Integration Executive Report: MIS in the Federal Government
3/13	- Product Spotlight: Disaster Prevention & Recovery
3/20	- Executive Report: Human Resource Development
3/27	- Product Spotlight: CASE Products

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ADVERTISERS INDEX

Accelerated Systems	57
Al Corp.	19
Alcatel Business Systems	49-51
Ameritech	108
Applied Software	54
Ashton-Tate	60,112-113
Attachmate Corporation	62
AT&T	56-57,71
Banyan Systems	58
Centel Information Systems	66
Chicago Soft	105
Chipcom	88
Cincom Systems	24,37,39,41
Codex	52,53,54,55
Communication Networks '89	25
Computer Associates	3
Cullinet Software	26-27
CW Circulation	109
CW Forecast '89	35
CW Marketplace	124
CW Response Cards	82,142
Data General	32
Dell Computer Corporation	90-91
Digital Equipment Corp.	16-17
Entrepreneurs Library	87
Epson America	22-23
Hamilton-Avnet Corporation	46
Hewlett Packard	64,115,116
Honeywell Bull	12-13
IBM	61,63,65,67
Inference Corporation	14-15
Informix Software Inc.	38,106-107
Infra-Structures	52
Innovation Data Processing	7
Integrated Systems Technologies,Inc.	104
Interface Systems	33
Invitational Computer Conference	102
Landmark Systems	110
Leasametric	78
Local Data/DatAmerica	85
Macro 4	10
McCormack & Dodge	148
McDonnell Douglas Professional Services	104-105
Metaphor	122-123
Micro Focus	43
Microsoft Systems	34/35,44-45,72-73
NEC	C3
Netec	41
Network Equipment Technologies/ ComDesign	120-121
Northern Telecomm	76-77
Novell	68-69
On-Line Software	30-31
Open Software Foundation	93
Oracle Corporation	9
PARS Service Partnership	14,15,18
Pilot Executive Software	117
Platinum Technology	29
Prime Computer	103
Proteon	100
Qualstar Corporation	123
Radio Shack	48
Realia	34
Relational Technology Inc.	28
SAS Institute	75
Siemens	118
Softool Corporation	42
Software AG	40
Software Engineering of America	11
Sun Microsystems	79-81
SunRiver Corporation	18
Syncsort	5
Synoptics	114
TBS Software	56
3 Com	97,99
Travtech	39
Universal Data Systems	86-87
Verilog USA	37
VI Systems	92
Video Seven	36
Winterhalter	84
Wyse Technology	70
Zenith Data Systems	74

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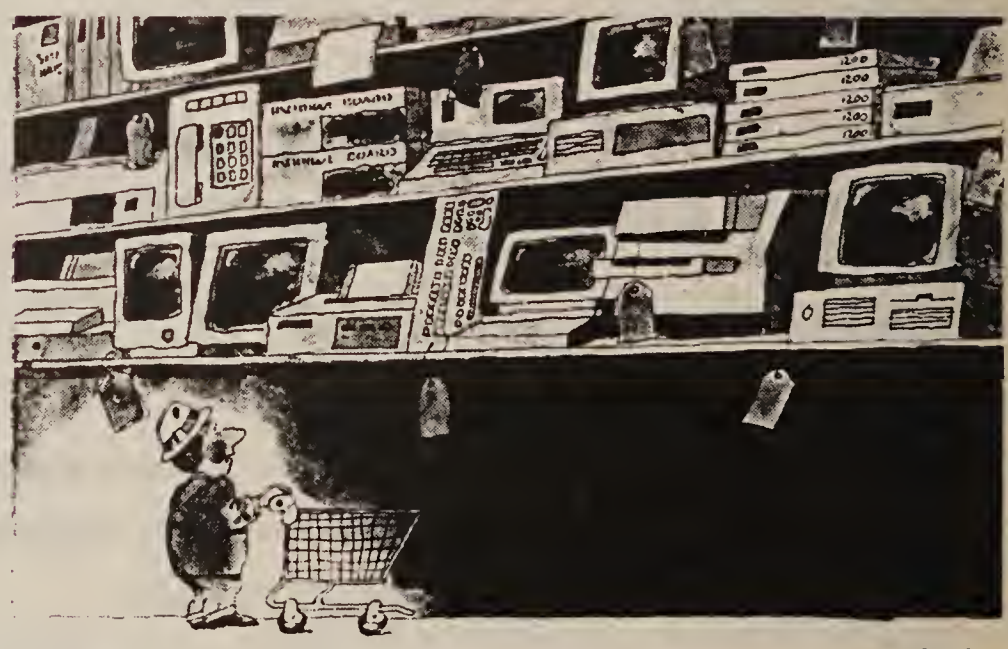

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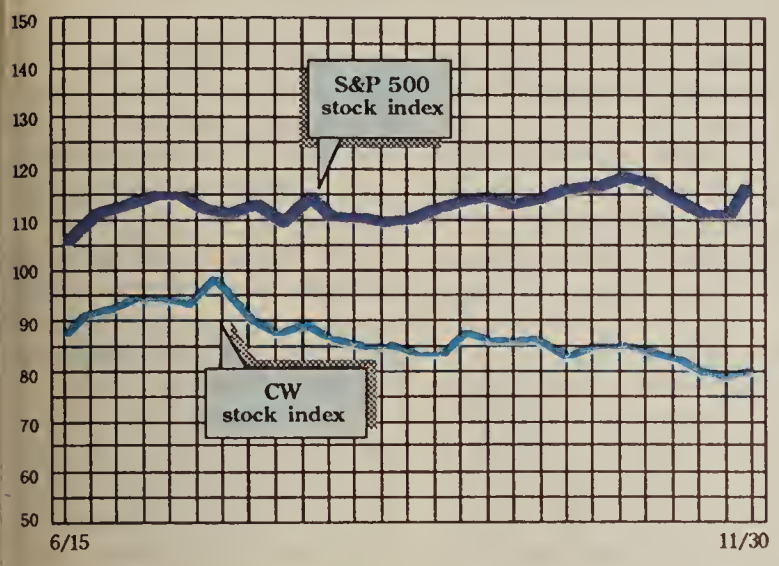
Issue Date	Topic	Ad Closing Date
Dec. 5	LAN's	Nov. 18
Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

STOCK TRADING INDEX



Indexes	*Last Week*	*This Week*
Communications	94.4	**95.9**
Computer Systems	88.1	**90.8**
Software & DP Services	96.4	**99.2**
Semiconductors	50.7	**51.6**
Peripherals & Subsystems	73.8	**75.1**
Leasing Companies	101.5	**103.8**
Composite Index	78.2	**79.9**
S&P 500 Index	111.9	**115.5**

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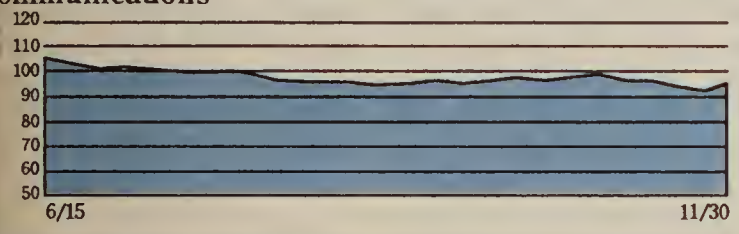

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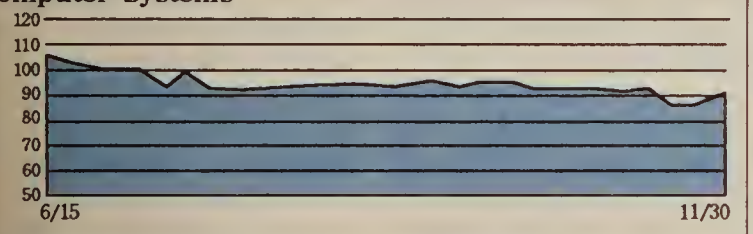

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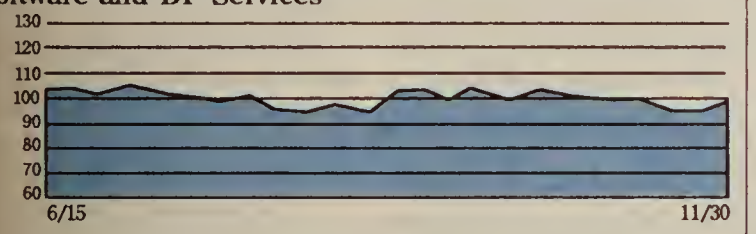

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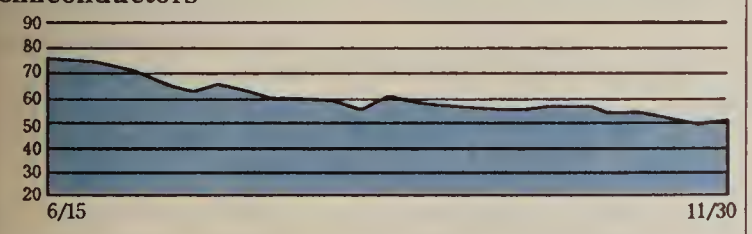
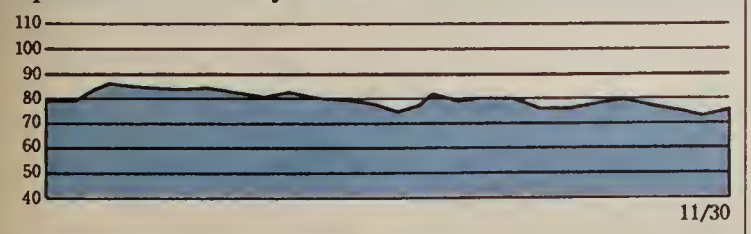
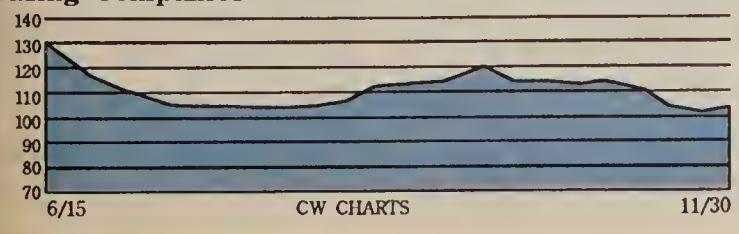


Peripherals and Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOV. 30, 1988

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 30 1988	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	97	81	93	0.8	0.8
Q	ANDREW CORP	19	11	17.2S	0.0	0.0
Q	ARTEL CDMM CORP	3	1	1.S	-0.3	-14.3
N	AT&T	30	24	29.87S	1.9	6.7
Q	AVANT GARDE COMP INC	3	0	0.37S	0.0	0.0
Q	AVANTEK INC	9	4	4.37S	-0.1	-2.8
N	AYDIN CORP	26	18	21.2S	0.0	0.0
N	8ELL ATLANTIC CORP	75	62	70.7S	D.4	0.S
N	BELLSDUTH CORP	44	3S	40.12S	0.9	2.2
Q	COMPRESSION LABS INC	5	3	3.12S	-0.1	-3.8
O	COMPUTER NETWORK TECH	3	1	1.407	0.0	0.0
D	CONTEL CORP	39	27	38.87S	1.6	4.4
Q	DATA SWITCH CORP	10	4	S	-0.4	-7.0
Q	DIGITAL COMM ASSOC	38	19	19.87S	0.0	0.0
Q	DYNATECH CORP	24	18	19.7S	0.0	0.0
Q	FI8RONICS INTERNATIDNAL INC	S	2	4.12S	0.3	8.2
Q	GANDALF TECHNOLOGIES	8	5	S.87S	0.3	4.4
Q	GENERAL DATACOMM INDS	S	3	3.7S	-0.1	-3.2
N	GTE CORP	4S	34	4S.12S	1.9	4.3
Q	INFOTRON SYS CORP	14	5	10.2S	-0.3	-2.4
N	ITT CORP	SS	42	50.7S	1.6	3.3
N	M A CDM INC	11	8	8.S	-0.S	-S.6
Q	MCI CDMMUNICATIONS CORP	24	9	22.87S	2.4	11.6
Q	NETWORK EQUIPMENT TECH INC	23	13	1S.37S	1.4	9.8
Q	NETWORK SYS CORP	12	7	9.S	0.4	4.1
N	NORTHERN TELECOM LTD	20	15	16.62S	0.8	4.7
Q	NOVELL INC	32	18	28.2S	0.8	2.7
N	NYNEX CORP	71	61	65.87S	0.6	1.0
N	PACIFIC TELESIS GRDUP	32	2S	31	1.3	4.2
N	PARADYNE CORP	6	4	S	-0.3	-4.8
A	PENRIL CORP	5	2	4.125	0.1	3.1
N	PLESSEY PLC	41	24	39	-0.8	-1.9
N	SCIENTIFIC ATLANTA INC	16	10	11.7S	0.8	6.8
N	SDUTHWESTERN 8ELL CORP	42	33	41.5	1.4	3.4
Q	3 COM CORP	24	16	19.87S	2.S	14.4
N	U S WEST INC	S9	47	S7.87S	2.0	3.6

Computer Systems

Q	ALLIANT COMPUTER SYS	9	3	3.87S	-0.6	-13.9
Q	ALPHA MICROSYSTEMS	8	3	6	0.3	4.3
Q	ALTOS COMPUTER SYS	13	7	7.S	0.3	3.4
A	AMDAHL CORP	28	13	17.S	-0.S	-2.8
Q	APOLLO CDMPUTER INC	17	7	7.12S	0.1	1.8
Q	APPLE COMPUTER INC	48	30	37.62S	1.0	2.7
N	BOLT BERANEK & NEWMAN	19	11	12	0.8	6.7
Q	BRITTON LEE INC	3	1	2	0.1	3.2
N	COMPAQ COMPUTER CORP	66	39	54.5	1.S	2.8
Q	COMPUTER AUTOMATION INC	14	3	6.375	1.6	34.2
A	COMPUTER CONSDLES INC	9	3	7.25	0.S	7.4
Q	CONCURRENT COMP CORP	7	4	4.37S	-0.1	-2.8
N	CONTROL DATA CORP	31	16	17.87S	1.0	S.9
Q	CONVERGENT TECH	7	3	6.813	0.4	6.9
Q	CONVEX COMPUTER CORP	11	6	9	0.1	1.4
N	CRAY RESH INC	89	53	SS.37S	2.1	4.0
Q	DAISY SYS CORP	12	6	6	0.1	2.1
N	DATA GEN CORP	28	17	17.7S	0.4	2.2
N	DATAPOINT CORP	6	4	4.12S	0.0	0.0
Q	DELL COMPUTER CORP	13	8	10.875	0.8	7.4
N	DIGITAL EQUIP CORP	145	86	93.625	2.3	2.S
N	FLOATING POINT SYS INC	5	3	2.625	0.0	0.0
N	GOULD INC	23	10	23.25	0.0	0.0
N	HARRIS CORP	33	22	27	1.0	3.8
N	HEWLETT PACKARD CO	66	44	48.375	1.1	2.4
N	HONEYWELL INC	77	51	S9.7S	-0.4	-D.6
N	I8M	130	104	118.5	2.9	2.5
Q	INFDRMATION INTL INC	16	10	13.2S	0.3	1.9
Q	IPL SYS INC	5	1	4.625	0.3	S.7
N	MAI BASIC FOUR INC	21	8	9.25	0.4	-8.0
N	MATSUSHITA ELEC INDL LTD	230	156	199.S	6.S	3.4
Q	MEGADATA CORP	4	1	1.625	0.1	8.3
Q	MENTOR GRAPHICS CORP	37	16	27.S	2.3	8.9
N	NBI INC	7	2	2	0.1	6.7
N	NCR CORP	70	S1	S2	0.3	0.5
N	PRIME COMPUTER INC	19	12	17.7S	1.8	10.9
Q	PYRAMID TECHNOLOGY	16	S	1S	-0.4	-2.4
Q	SILICON GRAPHICS CORP	25	14	1S.2S	-0.9	-5.4
Q	STRATUS COMPUTER	32	16	23.87S	1.6	7.3
Q	SUN MICROSYSTEM INC	41	2S	27.37S	0.3	0.9
Q	SYM8OLICS INC	2	1	1.12S	-0.1	-5.3
Q	SEQUENT COMPUTER SYS INC	19	12	16.37S	0.1	0.8
N	TANDEM COMPUTERS INC	30	12	16.7S	0.9	S.S
N	TANDY CORP	49	28	42.62S	1.S	3.6
N	ULTIMATE CORP	22	9	9.37S	0.3	2.7
N	UNISYS CORP	39	2S	27.S	2.0	7.8
A	WANG LABS INC	17	8	8.2S	0.1	1.S

Software & DP Services

Q	ADVANCED COMP TECH	4	1	1.62S	-0.5	-23.5
Q	AMERICAN MGMT SYS INC	19	9	13.5	0.1	0.9
Q	AMERICAN SOFTWARE INC	16	7	1S.87S	0.6	4.1
N	ANACOMP INC	12	S	7.62S	-0.1	-1.6
Q	ANALYSTS INTL CORP	10	6	10.12S	0.0	0.0
Q	ASHTON TATE	31	1S	21.87S	-0.9	-3.8
Q	ASK COMPUTER SYS INC	16	6	14.12S	1.5	11.9
Q	AUTODESK INC	31	16	2S.S	1.S	6.3
N	AUTO DATA PROCESSING	47	3S	37.62S	0.9	2.4
Q	8MC SOFTWARE INC	11	8	9.7S	0.0	0.0
Q	BOOLE & 8ABBAGE INC	10	7	9.5	0.0	0.0
N	8USINESSLAND INC	1S	7	12.875	0.8	6.2
N	COMPUTER ASSOC INTL INC	33	22	28.375	1.4	S.1
Q	COMPUTER HORIZONS CDRP	12	7	8.625	0.0	0.0
N	COMPUTER SCIENCES CORP	56	38	44.25	0.1	0.3
Q	CORPORATE SOFTWARE	1S	6	9	0.D	0.0
N	COMPUTER TASK GROUP INC	17	9	1S.12S	2.0	15.2
Q	CDGNOS INC	8	4	6.87S	0.4	S.8
Q	COMSHARE INC	2S	13	20.7S	1.S	7.8
N	CULLINET SOFTWARE INC	9	4	S.75	0.9	17.9
Q	DUQUESNE SYS INC	22	1S	20	1.8	9.6
N	GENERAL MTRS (CLS E)	4S	30	41.12S	0.4	0.9
Q	HOGAN SYS INC	6	3	4.62S	0.4	8.8
Q	INFORMIX CORP	26	7	7	0.3	3.7
Q	INTELLICORP INC	4	2	3.25	-0.1	-3.7
Q	KEANE INC	16	6	1S.5	D.3	1.6
Q	LOTUS DEV CORP	34	1S	17.75	0.6	3.6
Q	MANAGEMENT SCI AMER	14	6	7.375	0.6	9.3
Q	MICRO PRO INTL CORP	4	2	2.313	0.0	0.0
Q	MICROSOFT CORP	71	40	47.25	1.3	2.7
Q	MORINO ASSOCIATES INC	20	10	17.5	1.S	9.4
Q	NATIONAL DATA CORP	32	19	19.625	0.1	0.6
Q	ON LINE SOFTWARE INTL INC	14	4	5.75	0.0	D.D
Q	ORACLE SYS CORP	22	10	17.25	0.8	4.5
N	PANSOPHIC SYS INC	19	12	11.625	-1.S	-11.4
Q	PHOENIX TECHNOLOGIES INC	18	12	12.5	-0.8	-S.7
Q	POLICY MGMT SYS CORP	26	17	2S.2S	1.3	S.2
Q	PROGRAMMING & SYS INC	16	7	16.37S	0.9	5.6
Q	RABBIT SDFTWARE INC	3	2	2.7S	0.0	0.0
Q	RELATIONAL TECHNDLOGY INC	21	12	13.S	1.3	10.2
Q	REYNOLDS & REYNOLDS CO	24	14	21.S	0.S	2.4
Q	SEI CORP	22	12	17.2S	-0.3	-1.4
Q	SHARED MED SYS CORP	27	14	17.2S	1.3	7.8
Q	SAGE SOFTWARE INC	8	5	6.87S	0.1	1.9
Q	SOFTWARE PU8G CORP	27	6	22	1.8	8.6
A	STERLING SOFTWARE INC	9	S	S.37S	-0.4	-6.5
Q	SUNGARD DATA SYS INC	20	10	1S	-0.3	-1.6
Q	SYSTEMATICS INC	34	20	29.S	3.0	11.3
N	SYS. SOFT INC	24	8	23.7S	2.0	9.2
Q	VM SOFTWARE INC	18	7	1S.12S	0.4	2.S

Semiconductors

N	ADV MICRO DEVICES INC	17	7	7.5	-0.1	-1.6
N	ANALOG DEVICES INC	16	8	11	0.6	6.0
Q	ANALOGIC CORP	8	S	6.S	-0.8	-10.3
Q	CHIPS & TECHNOLOGIES INC	21	8	11.S	0.0	0.0
Q	INTEL CORP	37	19	20.S	0.8	3.8
Q	LSI LOGIC CORP	14	7	9.12S	0.9	10.6
Q	MICRON TECHNOLOGY INC	26	8	1S.5	-0.1	-0.8
N	MOTOROLA INC	SS	36	37.625	0.8	2.0
N	NATL SEMICONDUCTOR	1S	8	8.875	0.S	6.0
N	TEXAS INSTRS INC	60	35	3S.37S	0.S	1.4
A	WESTERN DIGITAL CORP	18	11	11.875	0.1	1.1

Peripherals

Q	ALLOY COMP	6	2	2.875	-0.1	-4.2
N	AM INTL INC	6	3	4.875	0.1	2.6
Q	AST RESH INC	17	6	7.87S	0.4	S.0
Q	AUTO TROL TECH CORP	6	3	4.875	0.0	0.0
Q	8ANCTEC INC	12	S	9.75	0.S	S.4
Q	CIPHER DATA PRDDS INC	10	6	8.75	0.3	2.9
A	COGNITRONICS CORP	4	2	2.625	0.S	23.S
Q	CONNOR PERIPHERALS	10	7	7.125	0.0	0.0
A	DATAPRODUCTS CORP	13	7	11.25	0.S	4.7
A	DATARAM CORP	9	S	6.875	-0.S	-6.8
N	EASTMAN KODAK CO	53	39	4S.2S	-0.4	-0.8
Q	E M C CORP MASS	19	4	4.37S	-0.1	-2.8
Q	EMULEX CORP	11	4	10.25	0.4	3.8
Q	EVANS & SUTHERLAND	2S	13	14.S	-0.3	-1.7
Q	ICOT CORP	S	2	2.S	0.0	0.0
Q	INTERLEAF INC	21	6	7.12S	0.1	1.8
Q	IOMEGA CORP	S	1	3.62S	0.4	11.S
Q	LEE DATA CORP	4	3	2.87S	0.1	4.S
Q	MASSTOR SYS CORP	3	1	2.375	0.3	1S.1
Q	MAXTOR CORP	16	6	7.S	0.4	S.3
Q	MICROPOLIS CORP	30	6	7.25	0.8	11.5
Q	MINISCRIBE CORP	14	S	7.62S	0.6	8.9
N	MINNESOTA MNG & MFG CO	68	55	60.37S	1.4	2.3
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	4.938	-0.1	-2.S
Q	PRIAM CORP	3	1	1.125	0.0	0.0
Q	PRINTRONIX INC	11	7	8.37S	-0.1	-1.S
N	QMS INC	15	6	6.625	0.1	1.9
Q	QUANTUM CORP	14	9	12.2S	0.3	2.1
N	RECOGNITION EQUIP INC	12	6	9.S	-0.3	-2.6
Q	REXON INC	9	4	6.87S	0.3	3.8
Q	SEAGATE TECHNOLOGY	23	7	7.12S	0.5	7.5
N	STORAGE TECH CORP	4	1	1.62S	0.1	B.3
Q	TANDON CORP	3	1	1.063	-0.4	-26.1
A	TEC INC	6	2	2.S	-0.3	-9.1
N	TEKTRONIX INC	30	19	19.37S	-0.5	-2.5
Q	TELEVIDEO SYS INC	2	0	0.438	-0.1	-12.4
N	XEROX CORP	63	50	SS	0.3	D.S

Leasing Companies

Q	AMPLICON INC	18	7	16	-0.3	-1.S
N	CAPITAL ASSOCIATES INTERNATIONAL INC	7	4	5.25	-0.3	-4.S
N	COMDISCO INC	2S	1S	20.625	0.4	1.9
Q	CONTINENTAL INFO SYS	9	2	2	-0.4	-1S.8
Q	LDI CORPORATION	14	9	13.7S	0.S	3.B
Q	PHDENIX AMERN INC	4	2	3.625	0.4	11.S
Q	SELECTERM INC	6	3	S.2S	0.8	16.7

EXCH:N = NEW YORK;A = AMERICAN;Q = NATIONAL

Stocking spree

Holiday buyers revitalize over-the-counter industry issues

Whether it was an early Christmas season buying rush or the start of a long-awaited technology upturn remains to be seen. But there were strong signs of life in computer stocks last week, particularly in the over-the-counter market.

Leading the way were Apple Computer, Inc., up 2¼ points for the week to close Thursday at 38¾; 3Com Corp., up 3 points to close at 21⅛; Microsoft Corp., up 2⅝ points to 49; Ashton-Tate Corp., up 1½ points to 23; and Sun Microsystems, Inc., up 1¾ points to 28¾.

Among the giants, IBM gained 2¼ points to 118¼ and Digital Equipment Corp. added a healthy 3¾ points to 93⅞. Prime Computer, Inc. officially rejected MAI Basic Four, Inc.'s $20-per-share takeover bid, but Prime rose 1½ points to 17¼ and MAI added ¾ of a point to 9⅛.

Not everyone shared in the week's wealth, however. Digital Communications Associates, Inc. plummeted 2¼ points Thursday to reach a new low of 17⅝. It had traded as high as 38 points during the past year.

CLINTON WILDER

Waiting . . .

FROM PAGE 1

other governments, Congress, through the National Science Foundation, has not provided NCAR with enough money to buy the supercomputing power needed to efficiently run the necessary global simulations.

As a result, it has taken three years to crunch enough numbers to model the greenhouse effect during the next century; officials have said the process could have taken less than three months. NCAR's computers are oversubscribed, and the greenhouse project had to be shared with other projects from Washington's colleagues at NCAR.

In order to continue carrying out calculations that are drawing an increasing amount of worldwide attention, NCAR is turning to parallel processing as well as migrating to the Unix operating system.

NCAR has a Cray X-MP 48, a

Warren Washington

Cray 1-A (the oldest Cray), a new 8,000-processor Connection Machine parallel processing computer from Thinking Machine, Inc., two IBM mainframes and a sea of storage to use for atmospheric research projects.

The center's greenhouse model puts together an atmospheric model with an oceanic model developed in-house for Cray's proprietary operating system, COS. "Ocean models are incredibly demanding computations," said Bill Buzbee, the center's director of scientific computing.

And they are getting more complex. Completing one global calculation, such as doubling current carbon dioxide gases and looking 25 years into the future to gauge that effect on temperatures over a global grid with thousands of grid cells, takes about 200 four-processor CPU hours, Buzbee said.

Simply running the global model requires one programmer to put in the jobs and keep track of the runs and data archives and another programmer to change the variable in the model. Two scientists, including Washington, interpret the data.

NCAR's supers crunch a dazzling array of variables. For instance, a global warming would increase rain in the tropics and decrease it in the subtropics, Washington said. That only takes into consideration temperatures in atmospheric cells, or grids, absorption of sunlight or heat radiation from the Earth, transfer of heat energy from adjacent cells and similar conditions. When those calculations are done at higher latitudes, there is a feedback between ocean and land.

> IT HAS TAKEN three years to crunch enough numbers to model the greenhouse effect during the next century; officials say it could have taken less than three months.

"If you don't have that much snow, the sea ice melts and you're going from a white surface to a dark surface. The oceans can then absorb more solar radiation. You get an exaggeration of the greenhouse effect," Washington said.

Based on hundreds of CPU-hours of calculations, Washington predicted that temperatures at the northern latitudes will increase approximately 7 to 8 degrees Celsius by the year 2030.

Making ends meet

Buzbee hopes to offset his tight budget of about $14 million and do more critical work such as global simulations by integrating parallel processing. The Connection Machine, which was placed at NCAR this year by the Center for Applied Parallel Processing, is a start. For NCAR's needs, Buzbee said, parallel processing computers could match or exceed the capabilities of supercomputers. "Instead of spending a thousand hours on calculations, we could spend a hundred," he said.

Washington reported that the next version of his global simulation program for the greenhouse effect will be divided to run on parallel processors. Despite sharing time on the machine, running it on multiple processors will cut the time needed by one-third.

Buzbee said the organization also plans to upgrade from Cray's COS operating system to Unicos, a Unix derivative. The move will cut programmer training time and open up a wider library of software. However, the migration has not yet happened. NCAR's processors are so busy that the agency has not been able to take one out of service long enough to perform the conversion.

AT&T shift spotlights ISDN dilemma

BY ELISABETH HORWITT
CW STAFF

The 95%-digital long-distance network that AT&T has promised to deliver by the middle of next year will provide users with better quality and reliability in AT&T's transmissions without forcing them to jettison their existing networking equipment, the carrier claimed.

Companies can use their analog modems, private branch exchanges and telephone sets to access AT&T's digital network as long as the Bell operating companies continue to support analog lines over the local loop, carrier officials claimed. Conversion from analog to digital takes place at the carrier's central office, as it has all along with a mixture of analog and digital carrier facilities.

This leaves users and their local carriers in a quandary. If the Bell operating companies speed up their migration to all-digital facilities, they will force many of their customers to write off expensive investments in analog equipment. But if they convert gradually as their own analog switches run out of capacity — as many seem to be doing — they may draw criticism for impeding the progress toward advanced, end-to-end digital services.

At least one long-distance carrier, MCI Communications Corp., has indicated that it will not introduce Integrated Services Digital Network (ISDN) until such services become generally available from the regional carriers.

Timing is key

How a customer treats its local carrier's progress toward digital services is largely a matter of timing. A couple of years ago, for example, Pacific Bell told the California Department of Water Resources that it will no longer support the utility's analog leased lines.

"We found that they were going toward an all-digital environment," said Archibald Noriega, chief of the utility's communications office.

"Luckily, we were at a transition point at which we wanted to implement a new digital system." However, the carrier's push toward digital services is likely to "leave a lot of companies out in the cold and cost them money," Noriega added.

Several users, however, said they trusted their carriers to lead them gradually into an all-digital world. "There will be a gradual cut-over period, as with leaded vs. unleaded gasoline," said a communications manager at a major insurance company who asked to remain anonymous. "Otherwise, we'd be up a creek."

The insurance company got rid of all its digital lines years ago because "they were costing us $100,000 a year and analog was cheaper," the manager said.

The regional Bell holding companies upheld their customers' belief that change will be gradual. Right now, for example, 35% to 40% of Bell Atlantic Corp.'s central offices are served by digital lines, company spokesman Larry Plumb said. ISDN, he added, "is not on the immediate horizon because both the carrier and its users have a lot of embedded investment."

Not all users are happy with the carriers' ponderous progress toward digital services. The New York State Public Services Commission is "concerned that New York Telephone Co. is slower to go to ISDN than other carriers such as Ameritech," said Dennis Murphy, director of telecommunications at Warner Communications, Inc.

AT&T

FROM PAGE 1

in the past two years.

Financial analysts generally praised the move as a gutsy one and hinted that it may signify a new AT&T approach to its business. AT&T stock closed Friday at 28¾, down 1⅛ points from Wednesday's close.

"Management stepped up to the plate and swung at the ball, when a couple years ago they would have stayed in the dugout," said Harry Rosenthal, vice-president of U.S. equities at Deutsche Bank Capital Corp. in New York. "That may embolden management to take similar steps next year in the computer operation."

Deja vu

The hefty write-down is the second multibillion-dollar charge against earnings by AT&T since the 1984 divestiture. The 1986 work force reduction of more than 27,000 jobs resulted in a $3.2 billion pretax charge that reduced annual earnings by $1.7 billion, but AT&T still eked out a scant profit for the year.

The end of the analog era will also mean job cuts at AT&T. The firm will redeploy or lay off 16,000 workers, including 10,000 network employees and 6,000 operators, as the analog network equipment is phased out in the next two years. The company said plans to cut 9,000 of those jobs were previously announced to employees.

But the Communications Workers of America (CWA), which represents 135,000 of AT&T's more than 300,000 employees, criticized the latest cutbacks and called on AT&T to "cut the rolls of fat from its top-heavy management."

"This company just has not bitten the bullet" on reducing management levels, CWA President Morton Bahr said in a prepared statement.

AT&T's chief rivals in the interexchange arena have already taken major write-downs for analog equipment and claimed to be at least as far as AT&T in their deployment of digital lines.

Sprint already has an all-digital fiber-optic network, according to Donald Forsythe, a spokesman for parent company United Telecommunications, Inc. The carrier took a $260 million write-down for networking equipment in the second quarter of 1987 and will report another write-off, "probably in the millions," at the end of this quarter, Forsythe said.

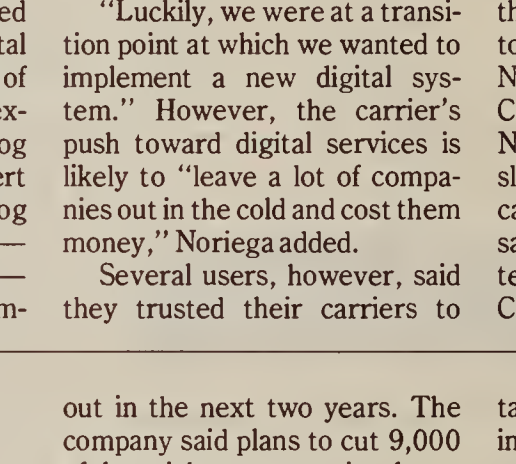
MCI is currently 65% digital and plans to be all-digital by the end of next year or by early 1990, according to company spokesman John Houser. The company had a $585 million write-down of satellite and analog microwave equipment in the last quarter of 1986 and is currently in the process of phasing out its remaining analog microwave equipment, Houser said.

AT&T also announced last week that it will accelerate deployment of its Integrated Services Digital Network (ISDN) Primary Rate service. The service, which supports 23 64K bit/sec. channels over an ISDN connection, was originally slated for introduction in 68 cities over links by the end of next year, according to AT&T spokeswoman Daisy Ottman. The carrier now plans to deploy the service in 62 cities by mid-1989, with additional cities planned for the second half of the year.

Senior Editor Elisabeth Horwitt contributed to this report.

Rocky ride

Charges and write-offs have put AT&T earnings on roller coaster since divestiture



*Estimated by Duff & Phelps, Inc.

CW CHART

DOD cuts net link

The U.S. Department of Defense said last week that it had temporarily cut connections between Milnet, its unclassified computer network, and Internet, the nationwide corporate and academic computer network that was crippled last month by a computer worm.

Susan Hansen, a Pentagon spokeswoman, said that the decision was made to cut ties to the network after an unidentified hacker penetrated a Digital Equipment Corp. VAX computer belonging to a defense contractor the night of Nov. 27-28.

Some computer specialists, however, said that they believed the intruder had penetrated the system several times in November, starting in the first week of the month.

The VAX belonged to Mitre Corp., based in Bedford, Mass. The computer is routinely used for electronic mail services, said Marcia Cohen, director of corporate administration at the company, in a prepared statement. During a telephone interview, she said, "No classified or sensitive information was lost."

Ties cut

The ties between Milnet and the rest of the network were cut Monday evening and had not been restored as of Thursday night. Hansen said that the links would be restored by the end of Friday.

Cliff Stoll, a computer security expert at Harvard University, posted an announcement on the network Wednesday indicating that "the bridge that usually connects the military side of the network to the civilian side of the network had been severed Monday evening."

The Defense Communication Agency (DCA) cut the connection after the intruder entered the network through a loophole in an anonymous File Transfer Protocol (FTP), a utility that allows users limited access to certain files, he said.

A fix to close the loophole in the anonymous FTP was posted on Internet in late October but apparently had gone unnoticed or was ignored by programmers at Mitre, Stoll said. "You can tell people that they have crummy locks, but you can't make them change them," he pointed out.

"Fortunately, not much was lost," Stoll added. "Few sites were vulnerable and even fewer sites were hit because not many sites have this particular hole." The intruder had evidently entered the Mitre computer after routing his calls through a number of networks in order to cover his tracks.

Vital link

Milnet, the military's computer network, communicates with hundreds of computers operated by military and defense contractors. It is linked to Arpanet, the computer network that was hit by a worm program allegedly written by Robert T. Morris Jr., a 23-year-old Cornell University computer science graduate student. The worm replicated itself on the network at an astonishing speed, ultimately causing some 6,000 computers to shut down.

The most recent security breach was a relatively minor incident, but it shows the jitters that exist as a result of the virus incident, Stoll said. "It will probably be a year before the jitters go away and people can get back to doing some serious work," he added. "The DCA was justified in cutting the connection because no one knew just how bad the problem was."

MICHAEL ALEXANDER

Dissection

FROM PAGE 1

er researchers said. They estimated that the original program contained some 3,200 lines of code.

From examining the worm's coding, the computer scientists have been able to speculate on the capabilities and intent of the program's author or authors.

Great care was taken to prevent the worm from being stopped, some scientists said. Files associated with the worm were deleted from disks in the machines at the earliest opportunity to minimize the chance of their being captured, and the contents of the files were encrypted in memory when loaded.

What is known is that the program was not the sophisticated wonder that many first believed it was. The cleverness was not in the program but only in the way the programmer exploited weaknesses in the Internet system, one scientist said.

"The code was really awful," said Eugene Spafford, an assistant professor in the computer science department at Purdue University.

There are places in the program in which calls were made to functions with either too many or too few arguments, he noted in a 40-page analysis of the Internet worm program.

The program also contains dead code — routines that cannot be executed because certain conditions have been omitted. "And there are sections of code that do some work but do not seem to accomplish anything," agreed Chris Torek, a computer scientist at Maryland University.

Tales of the crypt

Yet, while sections of the worm's code contained these and several other elementary blunders, there were sections that were well thought out, Spafford said in a telephone interview.

The crypt routine, which contained many interesting modifications and functions and was used to check passwords, is nine times faster than the University of California at Berkeley's Unix version of crypt, he said. Also, the worm contained routines for both encryption and decryption, even though only the encryption capability was needed by the worm.

"This suggests to me that the routines do not appear to have been written by the same author as the rest of the code," he said.

THE WORM wiggled its way into the Internet network through bugs in a Sendmail program, used to transfer electronic mail from one machine to another.

A quick pickup

The crypt routine and other sophisticated sections of code could have been lifted easily from other programs and do not necessarily imply that the worm's author was assisted by others, said Donald Becker, a computer researcher in the advanced technology department at Harris Corp. in Palm Bay, Fla.

"I would say that with the exception of the crypt routines, it was the work of one person," he said.

The mistakes in coding may have been more a result of the worm author's hastiness to complete the job than his ineptness as a programmer, said a computer researcher in the computer systems research group at the University of California at Berkeley who asked not to be named.

"There is no question that the worm was released prematurely," he said. "I know for a fact that it was. We believe that there were three bugs that [the program's author] intended to exploit. Certainly he was aware of them, because he told others of their existence."

The worm wiggled its way into the Internet network through bugs in a Sendmail program, used to transfer electronic mail from one machine to another, and a "finger daemon" program, used to provide information about who is logged on to the system. Both are found in Unix 4.3.

A fix for a third loophole in File Transfer Protocol, also in Unix 4.3 and used to permit limited access to a file, was posted on the Internet network only days after Morris allegedly told a system administrator at Harvard University about the bug, the Berkeley researcher said.

Grand jury probe begins

A Harvard University computer programmer and graduate student appeared last week before a federal grand jury in Syracuse, N.Y., that is investigating the attack that shut down computers on the Internet computer network in November.

Harvard computer science graduate student Paul Graham and computer programmer Andrew H. Sudduth answered subpoenas served Nov. 21 by FBI agents in Massachusetts.

The investigation is believed targeted at Cornell University graduate student Robert T. Morris Jr., whom federal authorities suspect of launching the virus that ultimately shut down 6,000 computers and caused millions of dollars of damage, according to the Computer Virus Industry Association.

Morris was a computer science undergraduate at Harvard until June.

Sudduth has said that Morris called him to alert computer operators on the network that the virus he created had begun to run amok.

An FBI spokesman said he was unable to comment on the ongoing investigation or predict whether an arrest was imminent.

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HP creates smaller units

Three new divisions aimed at improving response time and creating a more entrepreneurial spirit within an entrenched company were announced by Hewlett-Packard Co. last week.

An overall reorganization of HP's computer operations was announced in late October, when the firm's Computer Systems Group was formed under the Network Systems Sector.

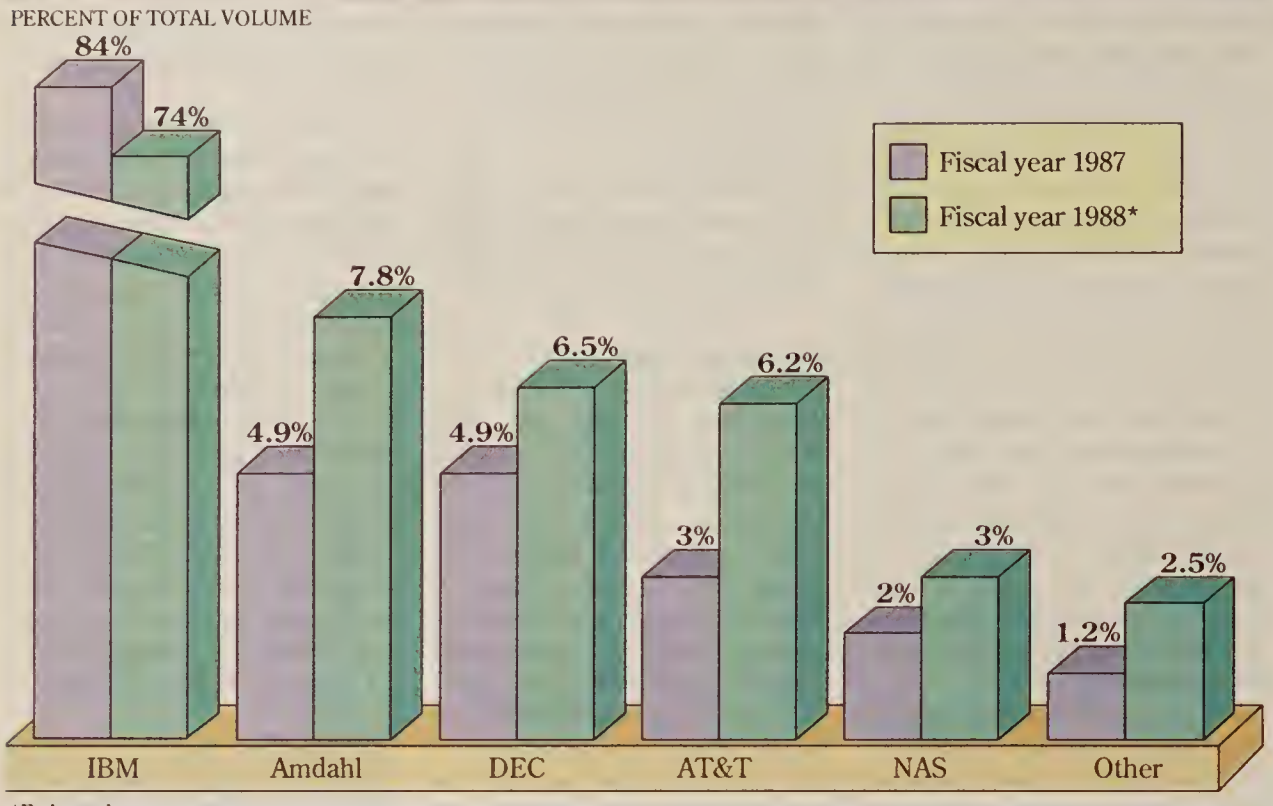
Last week, under that group, HP disclosed the formation of three new divisions: General Systems, for the company's multiuser business systems and for development of HP's Unix operating system; Data and Languages, which will feature laboratories intended to develop databases, languages and tools; and a Data Systems Operation, for factory-floor markets.

The reorganization creates more, smaller groupings within the company, each with its own goal.

TRENDS

Computer leasing

Lessors moving from IBM dependence toward vendor diversity



*Estimated

IBM's overwhelming dominance of equipment leased by third-party computer lessors is waning — and the independent leasing industry likes it that way.

According to the 1988 survey of Computer Dealers and Lessors Association (CDLA) members conducted by the Gartner Group, Inc., IBM equipment will account for 74% of CDLA members' leasing volume this year, down a significant 10% in 1987. This signifies third-party lessors' desire to diversify their portfolios from the traditional reliance on IBM mainframes and peripherals.

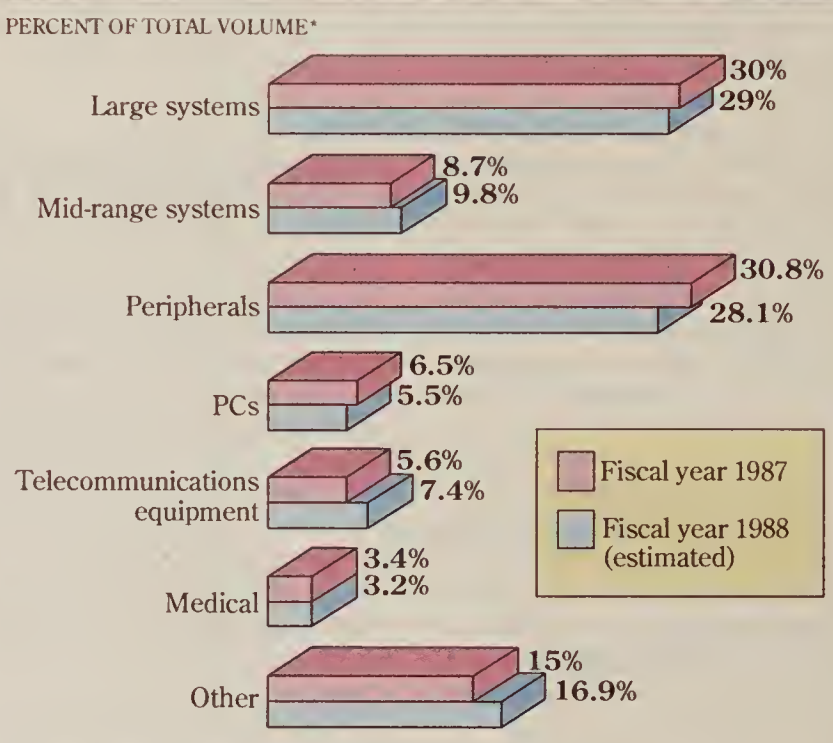
These markets have become increasingly competitive, partly because of a more aggressive marketing strategy by IBM Credit Corp. If the trend away from IBM continues, it may give the CDLA more ammunition in its current standoff with IBM on maintenance policies, microcode licensing and other issues.

The trend is also reflected in the types of equipment leased by CDLA firms in 1988. As a percentage of members' total volumes, mainframes and peripherals dropped, picking up the slack were mid-range systems and telecommunications gear.

Equipment leasing experienced strong growth in 1988, while equipment brokering volume fell. Leasing volume rose 39% to about $15.2 billion or 76% of total CDLA volume; buying and selling activity dropped 6% to $4.8 billion, or 24% of the total volume of $20 billion.

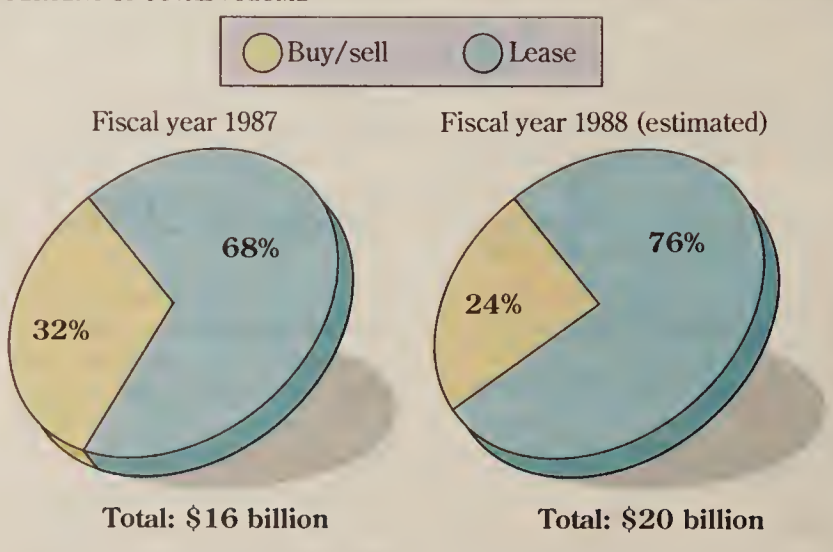
CLINTON WILDER

Product choices echo the shift



*May not total 100% because of rounding

Leasing just keeps getting bigger



SOURCE: COMPUTER DEALERS AND LESSORS ASSOCIATION AND GARTNER GROUP, INC.

INSIDE LINES

Whoops, hold everything. The recent Ashton-Tate copyright infringement suit against Fox Software has put the kibosh on the IEEE 1192 committee's plans to release its standards for a microcomputer-based database language next month. The 1192 committee was prepared to recommend a database standard based on a public-domain Jet Propulsion Laboratory Display Information System, or JPLDIS, mainframe package. JPLDIS also happens to be the product from which much of Ashton-Tate's best-selling Dbase is derived. Should Ashton-Tate win its suit, which would allow the company to copyright Dbase as a programming language, Dbase would never fly as a standard in the marketplace, an IEEE 1192 committee member said. Now, in a letter to Ashton-Tate Chairman Ed Esber, a committee chairman vows that the group will develop a set of standards that does not use commands used by Ashton-Tate. The result, he says, is that end users will refuse to get locked into a single company's slow-moving product line.

Mediator potential? Speculation continues on an expanded X/Open role in bringing together the strategies of the two Unix camps — the Open Software Foundation (OSF) and Unix International. Members of Unix International have implied that a stepped-up relationship between that group and X/Open is under way, but sources have said they cannot comment further at this time. X/Open finished up its board meeting in Dusseldorf, West Germany, last week, at which members considered a proposal that would "adjust" some of the group's "processes." The X/Open board consists of seven representatives hailing from OSF, seven from Unix International and one from the Netherlands.

Anybody home in Maynard? When IBM issued an audited Debit/Credit benchmark a few weeks ago, the firm showed results of the benchmark that were three times what DEC got when it reportedly ran a similar test. But IBM implemented only one-tenth the number of terminals that DEC did, a point many observers jumped on as a possible source of the discrepancy. Well, it seems IBM has run the test again — this time with the same number of terminals DEC used. IBM notched results that were slightly less than, but close to, the results it got before, thus disarming the critics. The world still awaits DEC's fully audited benchmark results, which are long overdue.

First member of a closed foundation? At the announcement of DEC's Ultrix 32 Version 3.0 in August, DEC said it would not add symmetrical multiprocessing (SMP) to Ultrix before it could see the OSF's implementation of SMP. Asked last week whether DEC still holds to that strategy, a DEC spokesman said the firm is doing its own work on an SMP Ultrix and that the timing of that announcement is "not linked to the OSF."

Those mysterious ISDN users. It must be frustrating to AT&T if, as the company told us last week, it has a whole bunch of new users of its ISDN Primary Rate Service but nobody is willing to stand up and be counted. The one company willing to admit it is even considering the service is American Express Travel Related Services; that firm just completed its three-month pilot test of AT&T's offering last week. But while admitting that the technology worked and that the test was successful, American Express spokesman Robert Golden said it is up to individual business units within his firm to decide whether they want to use the service. If they do decide to, they aren't going to tell anybody. Why? "We don't want to help our competitors," he said.

Open Tokin' — just what are these guys smokin'? Computer buyers must be just overjoyed at the rash of vendor-sponsored groups that have popped up this year with the goal of "opening up" standards for the benefit of users. Golly gee, the beneficent nature of the industry these days is enough to make a jaded old hot-line editor think that he's obsolete and that it's time to start looking for a grazing pasture. So, if enough users out there can call in (800-343-6474 or 508-879-0700) enough tangible benefits that they've felt from these charitable winds, we'll get News Editor Pete Bartolik to send in that nifty little form to find out the status of his Social Security fund.

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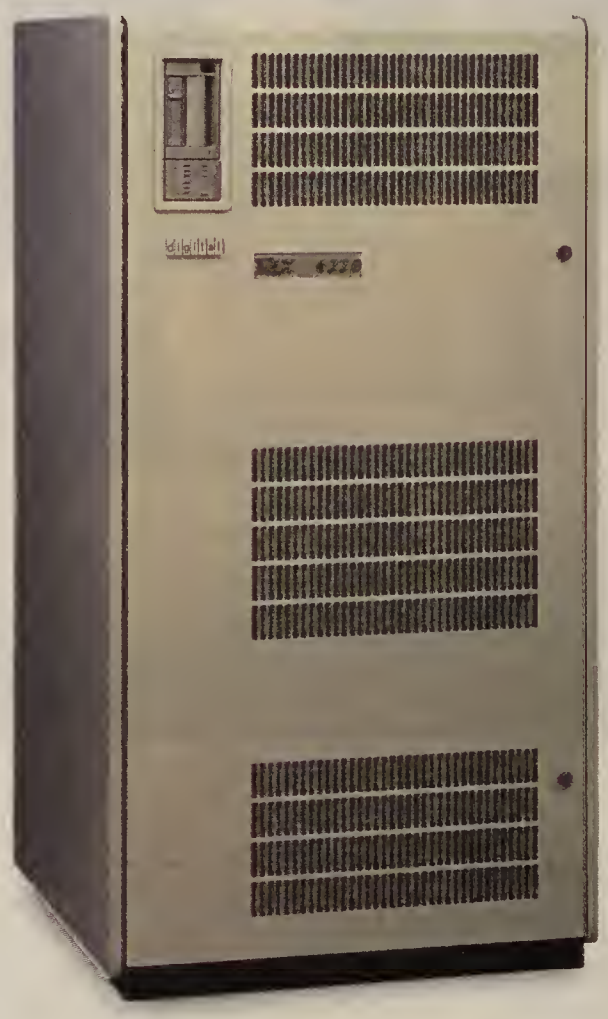

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